THE IRON TRADE REVIEW

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Railroad Buying is Very Active

Pennsylvania Leads in Placing Orders—Record for Pig Iron Production Again Broken—Specifications for Finished Materials Heavy

RAPID advances in prices of steel products, the filling up of mills on orders and the deferring of deliveries have brought to the railroads a realization of the importance of placing their orders quickly and they are doing so in all directions. Following the placing of an order for 175,000 tons of rails by the Pennsylvania, which was the largest order of its kind by that system, with one exception, in the past 10 years, the company has sent out an inquiry for 9,000 cars, while reports of many other important inquiries are heard. Some of these inquiries are being made definitely and a few have already developed into orders. October was the largest month of the present year in rail buying, with orders amounting to 590,000 tons, compared with 325,000 tons in September.

Pig Iron Output

The coke and anthracite furnaces of the country made a wonderful showing in October, when 3,120,340 tons of pig iron were produced, compared with 2,834,342 tons in September, which was the record-making output up to that time. Furnaces are now turning out pig iron at the rate of nearly thirty-six and three-quarter million tons a year.

Pig Iron

A pig iron buying movement of very large size was started in Pittsburgh during the last few days and sales of steel-making iron have amounted to fully 250,000 tons. Following the quiet buying of about 60,000 tons of basic by the Jones & Laughlin Steel Co., the Youngstown Sheet & Tube Co. purchased 75,000 tons of basic and bessemer, and other sales included 5,000 tons of basic to the American Steel Foundries, 8,000 tons of bessemer to the Republic Iron & Steel Co., 10,000 tons of basic to the Wheeling Steel & Iron Co., 10,000 tons of basic to the Allegheny Steel Co., 10,000 tons of malleable to the National Malleable Castings Co., 20,000 tons of basic to the American Rolling Mill Co. and 20,000 tons of basic to the Andrews Steel Co. At Buffalo, the Lackawanna Steel Co. has contracted for 70,000 tons of hot metal to be furnished by the Susquehanna furnaces, and in the same district, 30,000 tons of merchant iron have been sold. At Chicago and in the south sales are being made at $1 per ton higher than last week and in other centers prices have been advanced. Low phosphorus pig iron continues to climb.

Iron Ore

Sales of iron ore made for the season have amounted to 46,667,796 tons, of which 29,273,772 tons were Mesabi ores. The shipments from the Lake Superior district for October amounted to 7,146,875 tons, making the total to Nov. 1, 41,816,439 tons and indicating that the ore sold can easily be moved. An eastern Pennsylvania steel company has purchased 50,000 tons of low phosphorus ore.

Sheets, Plates and Bars

Inquiries for from 300,000 to 400,000 tons of bars for export are not receiving serious attention on account of the filled-up condition of the mills. Specifications on shapes, plates and bars are extremely heavy, and while 1.50c is the price of the leading interest, some companies are quoting as high as 1.70c, Pittsburgh. The demand for plates from car and ship building companies is very heavy. Sheets are also in active demand. The scarcity of billets has become more pronounced and some of the most important makers have their output sold for a considerable time ahead. Some extremely high prices, especially for forging billets, are being obtained.

Machinery

Domestic buying of machine tools continues to become more active, particularly by the railroads, which are now the largest buyers for delivery in this country. Considerable business is also coming from ship building interests. The demand for cranes is very active. Strikes in the central west are not assuming serious proportions and the strikes at Cleveland have collapsed.

MEN OF THE IRON TRADE

Who they are **Where they are** **What they are doing**

Charles J. Graham, vice president of the Graham Nut Co., Pittsburgh, was elected president of the American Hardware Manufacturers' Association at the convention of that organization recently at Atlantic City. Mr. Graham was born in Pittsburgh, where he received his education. In 1896, he was made secretary of the Graham Nut Co. and held that position until elected vice president. He is a director of the Graham company and of the Davis Brake Beam Co., Johnstown, Pa.

T. B. Wilson has been appointed steam engineer, of Cambria Steel Co., Johnstown, Pa. M. W. Nolan has been appointed assistant steam engineers, effective at once.

S. L. Schoonmaker, chairman of the board of the American Locomotive Co., has been elected a director and a member of the executive committee of the Central Foundry Co.

Joseph G. Butler Jr. has been made a member of the advisory board of the American Society—a federation for national unity just organized at New York City to foster patriotism and loyalty to American ideals.

Peter J. McGuire, Birmingham, Ala., has removed to Providence, R. I., where he has engaged in the structural steel business as a contracting erector under the name of the McGuire Construction Co. He has had an extensive experience in the south.

Vaughn Montgomery, formerly of the sales force of the Cincinnati Steel Castings Co., Cincinnati, has resigned to become associated with the Cincinnati office of Crocker Bros., in the capacity as salesman of pig iron and alloys.

John A. Denholm, assistant treasurer of the Wright Wire Co., Worcester, Mass., and George F. Wright, son of Mayor George M. Wright, president of the company, have been elected directors of the corporation to fill vacancies.

H. R. Bond, secretary of the New London Ship & Engine Building Co., New London, Conn., and Frank D. Potter, of Pouch & Co., New York, have been elected directors of the General Ordnance Co., recently organized to manufacture arms.

A. C. Dinkey, former president of the Carnegie Steel Co., Pittsburgh, now president of the Midvale Steel & Ordnance Co., Philadelphia, was tendered a farewell banquet by 60 operating officials of the Carnegie company Oct. 30, at the Duquesne Club, Pittsburgh. Judge J. H. Reed presided.

Juan de Zaraendiguia, Barcelona, Spain, who, during his four months' stay in the United States, has placed orders for more than $200,000 worth of machine tools and other machinery in different cities, visited last week

CHARLES J. GRAHAM

manufacturers in Worcester, Mass., where he is having grinding machines made at the plant of the Norton Grinding Co.

A. W. Wagner has retired from the presidency of the Terre Haute Malleable & Mfg. Co., Terre Haute, Ind., and his interest in the company has been taken over by F. R. Benson and H. L. Arnold, who have been associated with him. Mr. Benson has been elected president and Mr. Arnold secretary and treasurer. The business will be conducted as heretofore.

Henry K. Swinscoe, for three years superintendent of the Morgan Spring Co., Worcester, Mass., has resigned and is succeeded by Albert J. Maheu, who has been assistant superintendent and purchasing agent several years. Mr. Maheu's place has been taken by Michael W. Donahue, who was identified with the Wire Goods Co., in Worcester for 27 years.

Robert L. Willis, who has been connected with the Lexington, Ky., Utilities Co., has resigned to become efficiency and steam engineer of the Republic Iron & Steel Co., of Youngstown, O. C. C. Shackelford, chief engineer of the Republic company, has some extensive plans for increasing the efficiency of the steam engineering department, and this work will be in charge of Mr. Willis. The change was effective Oct. 26.

Ellis J. Gittings has been appointed manager of the sales department of the J. I. Case Threshing Machine Co., Racine, Wis., to succeed W. F. Sawyer, elected secretary to fill the vacancy caused by the resignation of Richard T. Robinson, as previously noted in *The Iron Trade Review*. Mr. Sawyer has been associated with the Case company for 14 years. R. B. Coleman succeeds Mr. Gittings as manager of the collection department.

Stanley H. Smith has been appointed district sales manager of the Pennsylvania and Maryland Steel companies at Chicago, to succeed Robert E. Belknap, transferred to New York City. Mr. Smith was born at Toronto, Ont., in 1885. He entered the service of the Pennsylvania Steel Co. in February, 1904, as a shop apprentice. Later he joined the sales force of the company at Steelton, Pa., and from there was transferred to Cleveland, where he represented the Pennsylvania and Maryland Steel companies for two and one-half years. Next he became first assistant to Mr. Belknap.

At the meeting of the board of directors of the New Departure Mfg. Co., Bristol, Conn., Albert F. Rockwell, founder of the company and inventor of the ball bearing devices which form the basis of the company's business, was succeeded to the presidency by De Witt Page, formerly general manager. Frank P. Furlong, Hartford, is vice president, A. C. Hitchcock secretary, and Chas. T. Treadway treasurer. A proposal to increase the capital stock of $500,000 was acted on favorably and the funds accruing from the sale of this stock will be expended in the construction of new buildings and equipment.

Domestic Demand for Tools Grows

Increase in Volume of Inquiries From Domestic Lines Offsets Decrease in War Demand—Latter Still Dominates Market

THE WAR DEMAND continued to dominate the machine tool market during October, although its volume was less than in previous months. Perhaps the most satisfactory feature during the month was the extent to which the domestic demand improved. Leading machine tool dealers and manufacturers report a more general demand from practically all lines of domestic industry and it is safe to state that the volume of domestic business, apart from direct war requirements, booked during October, was larger than such bookings in any similar period within the past two years. Machine shops of all kinds, automobile manufacturers, mine repair shops, railroad car shops and many other lines, were the sources of business which reached a large total during the month. While many of the orders placed were large, most of them were small and of a scattered character.

The railroads fulfilled recent expectations by expanding their requirements on a large scale. These interests, due to the enormous enlargement of the volume of traffic, have found it urgently necessary to improve their repair shop facilities. The Chicago, Milwaukee & St. Paul, the Seaboard Air line, the Illinois Central and the Ogden, Logan & Idaho railroad placed large orders. The Chesapeake & Ohio, Baltimore & Ohio, Philadelphia & Reading, Pennsylvania, New York Central, Lehigh & New England, Lehigh Valley and a number of other roads, all put out good-sized purchases. In addition, a great many roads issued inquiries which, in the aggregate, involve a large amount of business and it is believed the demand from these interests will remain active for some time to come. Among railroads which inquired on definite requirements, are the Chicago, Burlington & Quincy, Pennsylvania, Delaware & Hudson and others. The Copper River & Northern railroad, of Alaska, during the month placed orders for more than $100,000 worth of equipment.

Strikes Delay Deliveries

PRACTICALLY the only clouds in the machine tool makers' sky during October were the machinists' strikes which continued to prevail in New England and which became more general in the eastern and middle western states. In the Cincinnati district, there were walkouts during the month at most of the machine shops and machine tool building plants and numerous strikes also were reported from Chicago and Cleveland. Only a few of the concerns involved shut down their plants, the majority of them continuing to operate with as many men as they could muster. Toward the close of the month, operating conditions at many of the plants involved, particularly in the Cincinnati district, improved considerably by reason of the decision of many of the strikers to return to their work. In New England and the east, while many employes continued to be hampered, the situation toward the end of October had improved. The strikes have interfered seriously with production and have rendered the question of deliveries even more acute, so that practically all of the concerns involved are far behind in their shipments, many as much as two months.

An additional number of important ammunition contracts were let during October. The American Steel Foundries received an order said to involve approximately $30,000,000 worth of 8-inch shells. The shells are to be forged by the Steel Foundries, while the Westinghouse Electric & Mfg. Co. will finish them. The Westinghouse company booked another large rifle contract. The Bucyrus Co., South Milwaukee, Wis., took a large order for 8-inch shells. The Bradley Construction Co., New York, booked a contract involving approximately $50,000,000 worth of machine guns, small arms and cartridges. The Canadian Car & Foundry Co. received an additional order for 5,000,000 shells. The American Brake Shoe & Foundry Co. also was reported to have secured a large contract for explosive shells. Colt's Patent Fire Arms Mfg. Co., Hartford, Ct., is understood to have booked a very large contract for rapid-fire guns. The R. B. Phillips Mfg. Co., Worcester, Mass., which is busy on large war contracts, placed orders during the month for some 600 machine tools. The Baldwin Locomotive Works also was a big buyer during the month. A large number of war munition manufacturers continued to scour the market for equipment during the month, picking up lots wherever they were available.

Export demand again reached a large total during the month, good orders being received from England, Russia, Italy, France, Spain and Rumania. The demand from Spain and Italy also increased. Demand from abroad and from domestic concerns for machine tools for making war munitions, undoubtedly, would have been in much larger volume had the manufacturers been in a position to offer satisfactory deliveries. The difficulty in securing early deliveries now applies to almost all varieties of machine tools.

Ship Builders Buy Tools

SHIP BUILDERS on the Atlantic coast, all of whom are exceedingly busy, continued to figure actively in the market during October. The Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, placed an order for some 12 tools, involving a large expenditure. The Fore River Ship Building Corporation placed orders for some 25 to 30 heavy tools. The Baltimore Dry Docks & Ship Building Co., Baltimore, placed large orders for punching and shearing machinery, a plate planer, bending rolls and a number of machine tools. Numerous smaller orders also were placed by the various ship building concerns and further business is expected to come from these interests.

The crane market continues to reflect activity, although not to such a notable degree as in September. The recent heavy bookings have led crane manufacturers to adopt a more independent attitude and these interests have advanced their prices from 10 to 15 per cent on the average. Among important buyers of cranes during October were the Carnegie Steel Co., Jones & Laughlin Steel Co., Trumbull Steel Co., Lackawanna Steel Co. and other concerns.

Pig Iron Output 100,000 Tons Daily

Production in October Sets New Record—Merchant Furnaces Make Big Gain—More Stacks Resume

THE 100,000 tons-of-pig-iron-a-day mark has been reached and passed. This figure, which only a few years ago seemed impossible of early attainment, was set in October. Carefully compiled figures received by *The Iron Trade Review* from all of the manufacturers of the country, show that during October the average daily production of coke and anthracite pig iron was 100,656 tons.

As a result, the two and one-half-year-old record, broken in September,

AVERAGE DAILY PRODUCTION.

	1915.	1914.	1913.	1912.
January	51,323	60,624	89,929	66,220
February	59,521	67,450	92,095	72,372
March	66,009	75,534	89,123	77,791
Apr.	70,484	75,383	91,812	79,254
May	72,747	67,646	90,865	80,753
June	78,998	63,486	87,229	81,125
July	82,687	63,075	82,525	77,502
August	89,510	64,403	81,839	80,650
September	94,478	62,757	83,137	81,482
October	100,656	57,007	81,933	86,569
November	.....	50,042	74,322	87,985
December	.....	48,236	63,746	89,590
Average	76,764	62,934	83,980	80,124

was easily surpassed last month. The actual output in October was 3,120,340 tons, compared with 2,834,342 tons in September, a gain of 285,998 tons. October's production was at the annual rate of 36,750,000 tons. Only a few years ago the ultimate capacity of the country was set at 35,000,000 tons The production in 1915 will exceed the 30,000,000-ton mark, compared with an actual output in 1914 of 23,000,000 tons.

The enormous demand for steel-making iron which forced the steel works or non-merchant furnaces to bear the larger share of the recovery made in recent months, has resulted in those furnaces practically reaching their ultimate capacity. As a result, the larger portion of the gain in October was made by the merchant furnaces, which are now being called upon to supply the great demand for iron. There are still a number of merchant furnaces which can be put in shape for operation shortly, as the number of stacks active on Oct. 31 is 30 less than the record of recent years, set in February, 1913, at 306.

DAILY AVERAGE RECORD.

	Tons.
October, 1915	100,656
September, 1915	94,478
February, 1913	92,095
January, 1913	89,929
December, 1912	89,590
November, 1912	87,985
February, 1910	86,748
December, 1909	86,539
November, 1909	84,425
October, 1909	84,001
September, 1909	79,186

MONTHLY PRODUCTION RECORD.

	Tons.
October, 1915	3,120,340
September, 1915	2,834,342
May, 1913	2,816,825
January, 1913	2,787,800
December, 1912	2,777,292
October, 1912	2,683,645
December, 1909	2,682,702
October, 1909	2,604,037
September, 1909	2,375,589
October, 1907	2,359,690

The total production of merchant iron in October was 805,436 tons, compared with 681,411 tons in September, a gain of 124,025 tons. The average daily production of merchant iron last month was 25,982 tons, against 22,714 tons in September, a gain of 3,268 tons. The output of non-merchant iron last month was 2,283,768 tons against 2,124,288 tons in September, a gain of 159,480 tons. The steel works furnaces showed an average daily production during October of 73,670 tons, compared with 70,810 tons in September, a gain of 2,860 tons. The total daily average production in October of 100,656 tons, compares with 94,478 tons in September, a gain of 6,178 tons.

MONTHLY PRODUCTION.

	1915.	1914.	1913.
January	1,591,024	1,879,336	2,787,800
February ..	1,666,592	1,888,607	2,578,670
March	2,046,280	2,341,551	2,762,823
April	2,114,518	2,261,501	2,754,353
May	2,255,157	2,097,019	2,816,825
June	2,369,932	1,904,566	2,616,883
Total 1st half	12,043,503	12,372,580	16,317,354
July	2,563,311	1,955,324	2,558,275
August	2,774,825	1,996,483	2,537,018
September ..	2,834,342	1,882,718	2,494,098
October	3,120,340	1,767,227	2,539,924
November ..	.....	1,501,269	2,229,960
December ..	.....	1,495,325	1,976,138
Total 2d half	.....	10,598,346	14,335,413
Grand total	23,336,321	22,970,926	30,652,767

There were 276 furnaces active on the last day of October, compared with 266 on Sept. 30. Nine merchant furnaces were blown in and one blown out, a net gain of eight. Two steel works stacks were relighted and none was put out of blast. The active record is the best since June, 1913, when 283 furnaces were blowing. Comparing October with November, 1914, the low point of stack activities in recent years, a gain of 126 or 84 per cent is shown. Again, comparing October with December, 1914, the low month in production of the recent decline, a gain of 1,625,000 tons or 109 per cent is shown. Last month's production exceeded that of October, 1914, by 1,353,000 tons.

The output of ferro in October was 20,790 tons, against 21,288 tons in September, a loss of 498 tons. The production of spiegel in October was 10,346 tons, against 7,355 tons in September, a gain of 2,991 tons.

The merchant furnaces blown in were: Bessemer No. 1, Tennessee Coal, Iron & Railroad Co., Oct. 16; Ashland No. 2, Ashland Iron & Min-

OCTOBER PIG IRON

States.	No. of stacks.	No. in blast last day of month. Oct.	Sept.	Total tonnage made. Merchant.	Non-Merchant.	——Totals.—— Oct.	Sept.
Pennsylvania	156	116	112	221,244	1,132,008	1,353,252	1,193,219
Ohio	73	56	53	198,770	488,398	687,168	625,269
Alabama	45	24	23	148,363	64,442	212,805	187,186
Virginia	22	7	6	26,161	.....	26,161	19,391
New York	26	19	19	86,161	111,979	198,140	192,970
New Jersey	6	1	1	3,703	.....	3,703	6,232
Illinois	26	20	20	34,983	258,520	293,503	280,659
Colorado	6	2	2				
Indiana	10	10	10	27,939	201,750	229,689	225,482
Maryland	4	3	3				
Wisconsin	6	4	4				
Kentucky	7	3	2				
West Virginia	4	3	3	30,118	26,671	56,789	50,893
Tennessee	18	5	5				
Washington	1	0	0				
Georgia	2	0	0				
Texas	3	0	0				
Minnesota	1	1	1	27,994	.....	27,994	24,398
Michigan	3	2	2				
Missouri	1	0	0				
Spiegel—All states...						10,346	7,355
Ferro—All states....						20,790	21,288
Totals	420	276	266	805,436	2,283,768	3,120,340	2,834,342

ing Co., Oct. 28; Belfont, Belfont Iron Works Co., Oct. 1; Bessie, Bessie Furnace Co.; Bird Coleman No. 3, Lackawanna Iron & Steel Co., Oct. 5; Ella, Pickands, Mather & Co., Oct. 27; Robesonia, Robesonia Iron Co., Ltd., Oct. 8; Cumberland, Warner Iron Co., Oct. 1, and Max Meadows, Virginia Iron, Coal & Coke Co. La Follette No. 1, La Follette Iron Co., was blown out Oct. 28 for relining.

The steel works furnaces blown in were: Emma, American Steel & Wire Co., and one Edgar Thomson, Carnegie Steel Co., Oct. 15.

Lawrence furnace, of the Marting Iron & Steel Co., was banked Oct. 29. The relining of Dunbar No. 2 furnace, American Manganese Mfg. Co., is practically completed. No. 1 furnace is running on 80 per cent ferromanganese. Temple furnace of the Temple Iron Co., which was blown in Oct. 12, was blown out Oct. 25 for minor repairs.

Pipe Advanced

Black and Line Pipe Pushed Up—Also Wrought Product

Pittsburgh, Nov. 2.—The National Tube Co., on Nov. 1, advanced standard steel black pipe and line pipe one point, or $2 a ton. Steel boiler tubes last Friday were put up $4 a ton. Manufacturers of wrought iron black pipe and line pipe also have advanced prices $2 per ton and charcoal iron boiler tubes have been put up $4 a ton. Galvanized steel and iron pipe was not affected. The last previous change in black steel and iron pipe was May 1, when prices were advanced $2 a ton. Demand for tubular goods is fairly heavy. Advances in the prices of raw materials are largely responsible for higher prices for tubular goods.

Coke Advance

Is Maintained—Contracts for Large Tonnages Made

Pittsburgh, Nov. 2.—An eastern blast furnace interest has closed for 10,000 tons of coke a month for delivery during 1916, at $2.25, ovens. Another eastern consumer of 48-hour coke has taken a similar tonnage for first quarter shipment on a sliding scale contract, which provides an increase of 20 cents per ton in the price of coke for every advance of $1 per ton recorded by the market for basic pig iron. Spot furnace coke is commanding $2.75 and foundry fuel is selling at $3 a ton and above at the ovens. The *Connellsville Courier* for the week ending Oct. 23, says production was 428,319 tons, an increase of 7,288 tons over the previous week. The Connellsville regions are operating at approximately 80 per cent capacity; whether the output of coke can be further increased, depends upon the labor supply.

Ferro Prices

Show Some Irregularity and $100 Has Been Shaded

New York, Nov. 2.—A divergence in prices continues to be shown in the ferro-manganese market, especially for nearby shipment. Several transactions of the week for prompt, both in the east and middle west, are reported to have been closed on the basis of about $98, seaboard, or approximately $100, delivered. In some cases, buyers also report they have been able to obtain forward metal at about the same figure. Both English and domestic metal has figured in these sales. As previously noted, this shading on the English product is attributed to the seller dividing his commission with the consumer. For forward delivery running through the first half, sellers usually are able to book business at $100, seaboard. No large sales are being made and at the most, amount to several hundred tons in individual cases as consumers appear unwilling to load up for the future at present prices.

Peerless Motor Co.

Passes to General Electric Control —Chandler Expansion

Control of the Peerless Motor Car Co. has virtually passed to men allied with the General Electric Co., as the consent of important shareholders has been obtained.

It is also announced that the Chandler Motor Car Co., of Cleveland, has been reinforced by strong eastern interests and that its facilities will be greatly increased, so that it will become a $10,000,000 concern. Control will not be changed. The company has been an extremely successful one. Its plant has a capacity of between 12,000 and 15,000 cars per year and will be enlarged for the production of at least 20,000 cars in 1916.

Record Tonnage

The Pittsburgh Crucible Steel Co.'s blast furnace located at Midland, Pa., broke all previous daily and monthly records last month by producing 651 tons for the daily and 16,747 tons for the monthly record, which is an average of 540 tons per day.

Heavy Buying

Brings Purchases of Pig Iron to Quarter Million Tons

Pittsburgh, Nov. 3. (By wire.)—Including tonnages involved in the sales mentioned under yesterday's date line, purchases of steel-making pig iron grades in the Pittsburgh and Youngstown districts now involve more than one-quarter of a million tons for prompt and first half delivery. The present drive may continue indefinitely since practically every iron consumer in the district is negotiating for requirements.

It develops that the Youngstown Sheet & Tube Co. has closed for approximately 75,000 tons of basic and bessemer iron, paying as high as $15.50, valley, for basic. The American Rolling Mill Co., Middletown, O., has closed for a total of 20,000 tons of basic iron for second quarter delivery against third quarter requirements, taking 12,500 tons from one seller and 7,500 tons from another. At least half of the iron involved is to be shipped from the valleys. The Andrews Steel Co., Newport, Ky., also has taken 20,000 tons of first half valley basic from a broker. Both concerns bought just before the $15, valley, market was passed. Some producers now are asking $15.75 for basic and several lots of bessemer iron have been sold at $16.50, or 50 cents a ton above the previous price. One sale of bessemer iron involved 1,000 tons.

Follansbee Brothers, Follansbee, W. Va., have entered the market for 15,000 tons of basic iron for first half delivery. A central western company is inquiring for 6,000 tons of basic for delivery the first half of the year.

Foundry and malleable grades, which are active but not so excited as steel-making irons, jumped to $15.50, valley, but some tonnage is available at $15.

New Duplexing Plant

New York, Nov. 3. (By wire.)—A new duplexing plant to cost $2,000,000 is to be built at the South Chicago works of the Illinois Steel Co. It will consist of two 25-ton or larger bessemer converters and two 100-ton or larger tilting open hearth furnaces with auxiliary equipment.

THE OPEN HEARTH

A Contemptible Tale

ALONG with the arrival of the poet's melancholy days come political tales which are more ingenious than veracious. Practically all political stories are subject to certain discounts, some more than others. Particularly does one take them with a grain of salt at this period when one keeps in mind the fact that there will be a presidential campaign next year. This candidate's stock will be boosted sky high, or pushed below the zero mark, according to the aim desired. Absurdities, both for their fulsome praise and base condemnation, will crop out in liberal quantities from now until after election next year.

During the past week, there was published an account, which was an insult to President Wilson and steel manufacturers, whom the story involved. It was stated in the narrative that steel "barons"—whoever they are—are so pleased with the President's national defense program, "in view of the financial possibilities ahead for them", that they have sent an "emissary" to the President, pledging their support for his re-election next year.

It is no wonder that the President became aroused at the story and is understood to have demanded immediate reaction. But manufacturers in the steel business have equal reason for being angry. The story is a plain reflection on their American patriotism and their integrity. Too long has the practice of abusing the character of steel manufacturers generally been permitted to proceed, and it would be well to compel the publication printing the story to mention by names whom it means. Then it should be compelled to substantiate its charges, if it could—and, of course, it could not—or make immediate apology and to keep hands off in the future. Steel manufacturers have been entirely too easy-going toward the promiscuous and irresponsible criticisms which are heaped upon them. The practice should have been nipped when it was started, but it is not too late now to demand a halt.

The story is worthy of the utmost contempt and no matter whether spread by the peace-at-any-price advocates or others, shows the desperate straits to which those inspiring it have been put.

The Youngstown District

THE decision of the directors of the American Iron and Steel Institute to use the term "Youngstown district" instead of "valleys" for the Mahoning and Shenango valleys in statistical reports is a wise one. Youngstown clearly is entitled to the same distinction as Cleveland, Chicago, Pittsburgh and other cities which are the centers of districts. There has been some agitation in regard to making Youngstown a basing point for prices. It is already a basing point for many manufacturers of sheets, while billets and sheet bars are frequently quoted at the same price Youngstown and Pittsburgh. It is not likely, however, that Youngstown will be made a basing point for all products, although in dull times manufacturers will absorb all of the freight or at least part of it, as is done in the case of Chicago and other manufacturing centers where little attention is paid to Pittsburgh as a basing point during periods of depression. In spite of the increased importance of the Youngstown, Cleveland, Chicago and other districts, Pittsburgh will continue to dominate in the manufacture of steel products and the policy as to a basing point is not likely to be radically changed.

Getting on Better Terms

JUDGE GARY, in his admirable plea for publicity at the recent meeting of the American Iron and Steel Institute, referred to the fact that during the present decade there has been a pronounced change in the attitude of large business interests concerning the disclosure of facts and figures to the general public. He said that many voluntarily make regular and complete reports and that whenever requested by representatives of the press they furnish facts in corroboration or denial of rumors which are considered important, when the information can be given without prejudice to the business and appears to concern the public.

The relations of business men to the press have been becoming gradually more cordial, but much progress is yet to be made. In the past, the publication of inaccurate and sensational news has been due partly to the lack of frankness on the part of business men, and partly to the policy of some newspapers in not seeking the facts, while others, by depending upon immature and inaccurate reporters to collect news, have caused business men to be reluctant about giving information for fear of being misquoted and misrepresented. The better newspapers are now employing a higher grade of men to collect news and are thereby gaining the good will of business men who have information to impart. With greater accuracy on the part of the newspapers and more frankness on the part of business men, the newspapers will gain in reputation and sound business will be promoted. Newspaper editors have sometimes acted as if the publishing of a newspaper is not a business enterprise, but it is, and there should be no antagonism between it and other legitimate kinds of business.

THE OPEN HEARTH

Tearing Up Tariffs

THE WAR is shaking tariff systems of the nations from their very foundations. This fact is demonstrated in many ways, as is shown clearly by several articles published by *The Americas*, for October. Not only in the old world is there already talk of revision of the tariffs, but throughout Latin-America tariffs are already being revised and higher duties are being imposed in most cases. The United States cannot escape the effect of the many readjustments that are to be made and it is not surprising that even the most ardent free traders in the United States are being impressed by the fact that unprecedented conditions call for unusual action. There seems to be some lack of harmony at Washington, as to what ought to be done, and Secretary Redfield apparently was hasty in committing the White House to his ideas. It is encouraging to know that the President's mind is still open.

It seems certain that the duty will remain on sugar and that there may be a protective tariff on wool, but it is too much to expect a general protective act from the next congress. The country may, however, reasonably demand that steps be taken for a thorough investigation as to facts relating to the tariff and that such preliminary legislation as will be helpful shall be enacted, so that the United States will be ready to meet any conditions that may arise after the war is ended. The present outlook is that when peace is declared, a commercial war may be started which will be more disastrous in some respects than the bloody encounter now in progress.

Sound Recommendations

THE REPORT on the merchant marine by the National Foreign Trade Council is a strong document and shows clearly the impossibility of vessels being operated under the La Follette seaman's act, which would render competition with ships of other nations out of the question. It points out that if in practice the requirements apply to foreign vessels entering our ports, they increase our freight rates and handicap our trade, while if they do not apply to foreign ships, they drive our ships out of business.

The recommendations that congress establish a permanent shipping board composed of five members experieneced in shipping and foreign trade and having power to recommend to congress the measures necessary for the maintenance of United States shipping upon a reasonable basis with other nations, always having due regard for upholding American standards of living and compensation, and that the President be empowered to suspend the operation of such of the provisions of the seaman's act as he may consider detrimental to the interests of American shipping until congress, having before it the advice of the shipping board, has revised and modernized the United States navigation laws, or that the most objectionable provisions of the seamen's act be eliminated, are admirable and will commend themselves to the legislators who are willing to deal fairly with the merchant marine. In time, such a shipping board would have before it an immense amount of valuable information and would wield great influence in the halls of congress.

Iron in Path of Peace

A PLAN which has been dubbed in England an "extraordinary scheme of proposed spoliation" has been brought to light by the publication of the confidential memorandum which was addressed to the German imperial chancellor and the federal states of Germany some months ago by six great industrial and agricultural associations in Germany in reference to the conditions of future peace and possible war. One of the striking features of this document is that, before peace is declared, methods of preparing for another war are being considered and that the iron and steel industry is the most important factor. The plan suggests the absorption of Belgium by Germany and the confiscation of the French iron ore district of Meurthe and Moselle, as well as extensive coal mining districts. It is stated that although the production of pig iron in Germany has risen since August, 1904, to about a million tons, and that of steel has exceeded a million tons, there is not an abundance of pig iron and steel and for gray iron shells only there have been required in recent months at least 4,000 tons per day—a rather surprising statement. It is particularly pointed out that if the production of Minette ore were disturbed, the war would be almost lost. "But," says the document, "how does the output of Minette appear in this war, and how would it present itself in a future war? If the fortress of Longwy, with the numerous blast furnaces in the district, were delivered up to the French and a new war broke out, German and Luxemburg blast furnaces, producing 20 per cent of the pig iron of Germany, would be paralyzed in a few hours by long-range French guns."

This document indicates very clearly that before terms of peace are decided upon, the future of the great iron ore and pig iron producing districts of Belgium and France now held by the Germans will be a bone of contention, which may long delay a settlement.

Prices Present and Past

Quotations on leading products November 3, average for October, 1915, average for August, 1915, and average for November, 1914. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Nov. 3, 1915.	Aver. for Oct., 1915.	Average for Aug., 1915.	Aver. for Nov., 1914.
Bessemer pig iron, Pittsburgh..	$16.95	$16.95	$15.89	$14.70
Basic pig iron, Pittsburgh.....	16.45	15.95	14.89	13.45
No. 2 Fdy. pig iron, Pittsburgh	15.95	15.57	14.70	13.70
Northern No. 2 Fdy., Chgo....	16.50	14.44	13.38	13.00
Lake Superior Charcoal, Chgo..	17.25	16.25	15.75	15.75
Mall., Bess., Chgo.....	16.50	15.12	13.38	13.00
Southern No. 2, Birmingham...	13.00	11.87	11.25	9.88
Southern Ohio No. 2, Ironton..	16.00	14.88	14.25	12.63
Basic, eastern Pa.....	17.50	17.50	15.25	13.50
No. 2X Virginia furnace.....	13.75	13.75	12.75	12.50
No. 2X foundry, Philadelphia..	16.25	16.25	15.00	14.25
Ferro mang., Balti., (prompt)..	100.00	105.00	100.00	68.00
Bessemer billets, Pbgh.....	26.00	25.50	23.00	19.00
Bess. sheet bars, Pbgh.....	27.00	25.50	24.00	19.50
Op.-h'th sh. bars, Pbgh.....	28.00	26.50	25.00	19.50
Open-hearth billets, Pbgh.....	28.00	26.50	24.00	19.00
Steel bars, Chgo.....	1.69	1.59	1.49	1.25
Steel bars, Pittsburgh.....	1.50	1.41	1.30	1.10
Iron bars, Philadelphia.....	1.55	1.55	1.40	1.15
Iron bars, Cleveland, local del'y.	1.50	1.39	1.22	1.20

	Prices Nov. 3, 1915.	Aver. for Oct., 1915.	Average for Aug., 1915.	Aver. for Nov., 1914.
Iron bars, Chgo. mill.....	$1.45	$1.37	$1.23	$0.98
Beams, Chicago	1.69	1.59	1.49	1.25
Beams, Pittsburgh	1.50	1.41	1.30	1.10
Beams, Philadelphia	1.659	1.559	1.459	1.25
Tank plates, Pittsburgh.....	1.50	1.42	1.30	1.07
Tank plates, Chicago.....	1.69	1.55	1.44	1.25
Tank plates, Philadelphia.....	1.709	1.559	1.459	1.25
Sheets, blk., No. 28, Pbgh.....	2.10	2.05	1.83	1.85
Sheets, blue an., No. 10, Pbgh.	1.70	1.60	1.36	1.35
Sh., galv., No. 28, Pbgh.....	3.70	3.50	3.93	2.85
Wire nails, Pittsburgh.....	1.85	1.76	1.61	1.55
Connellsville fur. coke contr....	2.50	2.25	1.75	1.69
Connellsville fdy. coke, contr...	3.00	2.48	2.25	2.25
Heavy melting steel, Pbgh.....	14.75	14.00	13.38	10.30
Heavy melting steel, east'n Pa..	14.50	14.50	13.50	9.50
Heavy melting steel, Chgo.....	12.50	11.56	11.50	8.25
No. 1 wrought eastern Pa.....	16.00	16.00	14.50	11.50
No. 1 wrought, Chgo.....	11.75	10.68	10.12	7.50
Rerolling rails, Chgo.....	13.75	13.25	11.75	9.50
Car wheels, Chgo.....	12.00	11.75	11.38	10.00

(For Additional Prices See Page 920.)

Pittsburgh Sells Large Tonnage

Buying of Basic by Steel Companies in Youngstown and Pittsburgh District—Prices Continue to Advance

Pittsburgh, Nov. 2.—Heavy buying of steelmaking pig iron characterizes an excited market in the Greater Pittsburgh district. Fully 175,000 tons of pig iron have been sold this week and the drive seems to be gaining momentum. Quiet buying by the Jones & Laughlin Steel Co., which took about 60,000 tons of basic iron last month, established the market for this grade at 50 cents a ton above the previously prevailing price. The Youngstown Sheet & Tube Co. has just closed contracts for approximately 48,000 tons of basic iron and 15,000 tons of bessemer iron at about $15.50 to $16, valley, respectively, for shipment before April 1. A fortnight ago the company took a round tonnage of gray forge iron. The American Steel Foundries has bought 15,000 tons of basic at $15.50, delivered, and the National Malleable Castings Co. has purchased 10,000 tons of this grade at what is understood to be $15.25, valley furnace. The Republic Iron & Steel Co. has bought 8,000 tons of bessemer iron at $16, valley, and the Wheeling Steel & Iron Co. has closed for 10,000 tons of the same grade at $16, valley. The Allegheny Steel Co. has taken about 12,000 tons of standard basic. A Cincinnati broker has bought 6,000 tons of basic iron from a valley blast furnace, paying $15.50 for shipment after Jan. 1. A local broker has sold 6,000 tons of basic at $15.50. The John A. Roebling's Sons Co., which has been a conspicuous eastern buyer, has obtained 2,500 tons of valley basic at $15.50, furnace. Basic iron has been established at $15.50, valley, since Oct. 31, and it is not unlikely that dealers will ask $16 before the end of this week. Bessemer iron is unchanged in position, but shows decided strength. Several sellers of foundry and malleable grades have advanced quotations to $15.50, valley, for prompt and future delivery. The average price of bessemer iron in October was $16, valley, an increase of $0.094 over September, and the average price of basic last month was $15.0147, or an increase of $0.0147 over the average for the preceding month, according to figures compiled by W. P. Snyder & Co.

Chicago Iron Up $1

Chicago, Nov. 2.—Upward tendency of Chicago pig iron continues unchecked and $1 has been added to the price of No. 2 foundry and malleable during the past week. All makers are now asking $16.50, Chicago furnace, for any delivery up to July 1. This quotation also includes basic, for which there continues to be some demand. These quotations are not guaranteed for any length of time and strength in the market indicates a higher level may be reached before long.

All possible productive capacity will be active Dec. 1, and tonnage for the remainder of this year is believed to be practically contracted, while large tonnages have been booked for first half. Comparatively little iron is on furnace yards and iron is being shipped as fast as produced, while consumers are asking that shipments be anticipated and almost no requests are received for holding iron on yards. Many melters are asking furnaces to increase their contracts and requests are numerous that December iron be shipped in November.

In addition to this, inquiry continues strong for tonnages of all sizes, a plow interest on the Mississippi river being in the market for perhaps 10,000 tons of foundry iron and a consumer of basic asking figures on a corresponding quantity of that grade. Numerous inquiries of 500 to 700 tons are current and all appear

(*For complete prices see page* 920.)

to be of a bona fide character. Lake Superior charcoal iron has been advanced $1 per ton during the past week and the range of prices has been increased from $16.25-$17.25 to $17.25-$18.25, delivered, Chicago. This increase was made in two jumps, the latest being announced Monday.

Southern iron appears to be moving in considerable tonnages in competitive territory, but prices in the north are yet relatively low and Birmingham iron does not enter the Chicago market proper.

Low Phosphorus Still Higher

Philadelphia, Nov. 2.—New high prices have been established in low phosphorus iron in this market where sales of this grade of the past week approximated 15,000 tons for shipment over the first half to western as well as to eastern buyers. Standard low phosphorus rose to $29, delivered, this territory, one sale for first half having been done at that figure, or over $28 at the maker's furnace. About 8,000 tons of standard were sold by another maker at $26, furnace, or $28.62, Philadelphia basis. Two buyers, one of which was an eastern Pennsylvania steel company, took several thousand tons each. Producers of standard quality now have practically no iron for sale for first quarter and little for first half. One of them has advanced to $29, furnace, or about $29.60, Philadelphia, and another is virtually out of the market. A genuine scarcity of low phosphorus appears to be developing. Canadian buyers are finding it impossible to satisfy all their requirements in this country. One buyer there now is trying to place several thousand tons monthly. Lebanon low phosphorus has been sold at $25, furnace, and higher now is quoted. One maker sold about 5,000 tons for first half.

A Harrisburg consumer placed 3,000 tons of basic for first quarter at $17.75, delivered, equaling the highest price recently reached on this grade in the east. Other negotiations for basic are in a preliminary stage, one of which is by a new buyer. Foundry iron has taken on more activity and the week's sales, which were well scattered, aggregated about 10,000 tons. These included 1,000 tons to Trenton, 500 to 1,000 tons to Wilmington, 1,000 tons to a stove maker and various other lots. Charcoal iron sales were about 2,500 tons. The Bethlehem Steel Co. was among the buyers. Lake Superior charcoal now has been advanced 75 cents to $1 a ton to $17.25, Buffalo, for Nos. 2, 3 and 4. Eastern Pennsylvania prices on foundry iron are holding firmly at $16.25 to $16.75, Philadelphia, for No. 2X for this year and at $17.25 upward for first half. One important maker this week raised to $17, furnace, or $17.79, Philadelphia, for first half. Virginia iron has been more active, one seller taking 7,000 to 8,000 tons in this and nearby territory, this week. Another maker sold 31,000 tons in October and has 50,000 tons in orders. The Virginia Iron, Coal & Coke Co. again has advanced 50 cents for first quarter or first half to $14.25, $14 and $13.75, furnace, for No. 2 plain, No. 3 and No. 4 and forge respectively, and to $14.50, $14.25 and $14, respectively, for second quarter exclusively. Another maker has gone to $14.50, furnace, for No. 2X for first half. Some makers are this week still quoted on the basis of $13.75 for No. 2X for nearby. A Lynchburg, Va., pipe maker has inquired for 10,000 to 12,000 tons of Nos. 3 and 4 forge and mottled, first half. An eastern Pennsylvania iron mill is out for 1,000 tons of standard forge.

It is reported that a Virginia producer is about to take up the making of basic and will be a competitor for eastern Pennsylvania business.

Moderate Expansion

New York, Nov. 2.—Miscellaneous buying of pig iron has continued to show some expansion in this territory, but the tonnage of sales or inquiry still is not heavy. One seller disposed of 5,000 tons of mixed grades in this immediate district during the week. Buying is chiefly for the first quarter or first half and it is believed by sellers that this movement will take on considerably more breadth during the next few weeks. A manufacturer of hoisting machinery in the Newark district took 1,000 tons of eastern Pennsylvania No. 2 plain for first half at $16.90, delivered, or about $16 at the furnace. Another consumer in the same district closed for 600 tons. The American Steel & Wire Co. was the buyer of several thousand tons of low phosphorus for first quarter shipment to Worcester. The McNab & Harlan Mfg. Co., Paterson, N. J., is inquiring for 2,400 tons of Nos. 2X and 2 plain for first quarter and the New Jersey Zinc Co. for 600 tons of foundry for first half. Prices are firm, but are not advancing generally, owing to the light buying. For this year the tidewater spread remains $16.25 to $16.75 for No. 2X, and for first quarter or first half. $17.25 to $17.75. Virginia iron under further advances now is quoted by leading sellers at $17.10 to $17.30, Jersey City, for No. 2X, first half. Lake Superior charcoal, of which there has been considerable buying, has risen 75 cents to $1 a ton in two advances in the week and Nos. 2, 3 and 4 now are held at $17.25, Buffalo. Exporters of iron have been encountering increased perplexities which are tending to restrict new sales. One of these is the congestion of freight at tidewater terminals growing out of the enormous export movement causing shipments to miss vessels upon which room had been engaged and resulting in demurrage charges to the seller since delivery in many cases has been specified alongside the steamer. Another has been the irregularity of the exchange market which is to the disadvantage of the seller where freight has been prepaid and orders have been booked for delivery at foreign ports. The steamship companies, to protect themselves, have adopted an arbitrary rate of $4.80, or considerably above the actual market, which is in effect the adoption of dollars and cents standards. Sellers similarly are figuring on a fictitious rate when now quoting abroad, which makes allowance for declines in exchange. Southern makers quoting in dollars are asking $25 c. i. f. Genoa. Chile is inquiring for 1,000 to 1,500 tons of foundry.

Buffalo Sales 100,000 Tons

Buffalo, Nov. 2.—The Lackawanna Steel Co. has contracted for a further heavy tonnage of hot metal from the Susquehanna furnaces nearby of the Rogers-Brown Iron Co., taking 70,000 tons for delivery over the first half of next year. This order constitutes arrangements to continue the delivery of hot metal to the Lackawanna, enabling the steel mill to increase its ingot capacity by taking over one-quarter of the iron producing capacity of Susquehanna furnaces.

Merchant pig iron to the extent of 30,000 tons was also sold during the week by all of the producing interests of this district, including foundry grades, malleable and basic. The furnace interests are shipping out iron in excess of the productive capacity of the going stacks of the district. The volume of iron being sent out is in excess of the total ever attained during any previous month of October. Yard stocks are being diminished at the rate of 1,000 to 1,500 tons per day, in the effort of the producers to satisfy the demands of the consumers for iron. The total tonnage of iron being shipped out is increased by the activity of the Genesee furnace at Charlotte, N. Y., which interest recently booked some heavy sales.

The demand for charcoal iron has caused the price to stiffen $1 per ton over previous quotations on the

(*For complete prices see page* 920.)

regular and special grades. In view of the heavy sales and the increased demand for foundry, malleable and basic irons, an early advance in the prices of these grades is anticipated.

Cleveland Prices Higher

Cleveland, Nov. 2.—The price of malleable and foundry pig iron at Cleveland has been advanced 50 cents and $16, furnace, or $16.30, delivered in the city, is now being quoted. It is possible, of course, that for outside delivery this price may be shaded in competitive territory, but it hardly seems probable that this would be necessary, owing to the strong condition of the market. The melt in the Cleveland district is large, but sales are not heavy at present. Cleveland agencies having furnaces in other cities are, however, enjoying good business. One firm sold about 90,000 tons in October and expects to sell considerable more this month.

Prices Higher

Cincinnati, Oct. 2.—Low prices on both southern and southern Ohio pig iron that were very evident a few days ago, have disappeared, and a higher level is now being maintained on all grades. During the latter part of last week, some southern furnace iron was sold in this territory at $12, Birmingham basis, for No. 2 foundry, for spot delivery, and a local melter also closed an order with a southern Ohio stack at $15.25, Ironton basis, for No. 2 foundry for last quarter delivery. These prices, which were considerably below what was considered to be the market level, disappeared yesterday, and today quotations are firm at from $13 to $13.50, Birmingham basis, for southern iron, for any delivery through the first quarter, and $16, Ironton basis, for southern Ohio makes for either prompt or first half shipment. Silvery iron is unchanged at from $19 to $19.50, furnace, for 8 per cent silicon, including Ashland and Jackson makes. Bessemer ferro-silicon is quoted at $22 for from 9 to 10 per cent at the furnace at Ashland, Jackson and New Straitsville, with one dollar differential for each per cent added. Sales are fair, and local houses are averging from 3,000 to 4,000 tons each week in new contracts in this territory. Inquiries are very uncertain, as a large number are being sent out to feel the market, and sometimes specify much larger tonnages than the amounts actually needed.

Improved Conditions

St. Louis, Nov. 2.—The local market is about devoid of inquiries for pig iron, but an improvement in conditions seems to be indicated by sales last week, consisting of 4,000 tons of scattering orders in Iowa, two lots of 400 tons each of Lake Superior car wheel iron, 300 tons of Lake Superior car wheel iron and 200 tons of southern No. 3.

Southern No. 2 is quoted at $13.50 to $14, Birmingham basis, for delivery over the first half of next year. Northern iron is held at $16.50, Chicago, and $16, Ironton.

Yards Almost Empty

Birmingham, Ala., Nov. 2.—Nov. 1 finds the yards of Birmingham district pig iron makers practically empty, according to statements issued by the various furnace interests today. During this week, they state that spot delivery iron is expected to go to $13.50 for No. 2 foundry, Birmingham.

Sales during October were heavier than expected, it is reported, one company's total sales for the month being placed at 50,000 and another at between 75,000 and 100,000 tons. During the past two weeks, the bulk of the sales has been for $13 and beginning today it is stated that there will be no more No. 2 foundry to be had at $12.50.

Inquiry is fairly good and is well scattered. Production for the past month is reported to have been slightly increased.

Steel Bars Go Begging

Inquiry so Tremendous That it Cannot be Considered by Mills—Active Domestic Demand

Philadelphia, Nov. 2.—A leading eastern Pennsylvania steel maker reports that he received during the past week inquiries for rounds, blooms and other ammunition forms totaling 300,000 to 400,000 tons, upon which no quotation could be made because of loaded-up capacity. These lots came from both domestic and foreign buyers and while some of them were in tentative form, they illustrate the enormous tonnage that is practically going begging because the mills cannot meet the demand. The Baldwin Locomotive Works inquired for 8,500 tons of 3¼ to 6¼-inch rounds for shipment to April 1, which it closed presumably with a Pittsburgh maker. This buyer also took about 2,000 tons of cold rolled rounds of different sizes. A manufacturer in this district has a requirement of 30,000 tons of shrapnel sizes in tentative form. Large rounds in the week were quoted here at 3.50c, Mill, but business was placed lower. For other bar descriptions, makers are forced by the heavy specifications to make few new sales. Some of them are not quoting at all. In one case, 2,000 tons, first quarter, could not be bid upon.

The Pennsylvania railroad bought some bars for shop needs for delivery during the next few months and the Baltimore & Ohio is inquiring for first half. The Steel Corporation took 900 tons of concrete bars for Panama at 1.45c, Pittsburgh. For domestic delivery, all makers quote 1.50c, Pittsburgh, but with some of them this is purely nominal. Leading makers ask 58 and 53 off for shafting, but about 2,000 tons were placed here at a lower price.

Out of the Market

New York, Nov. 2.—There is no diminution in the heavy new inquiry for large rounds, blooms and other rolled steel for shell needs. Easily several hundred thousands tons are pending at present, but the number of sellers and the tonnage offered by the mills is considerably less in view of the way capacity has been sold up. One eastern producer has nothing to sell before March or April. Another is practically out of the market. All makers are holding prices more firmly or higher and bids under 3.25c mill for large rounds are less acceptable. France put out a new inquiry for 6,000 tons of 3-inch rounds this week and Spain is reported in the market for a large tonnage. Italy has asked for 100,000 tons of 7 x 7 and 8 x 8-inch billets and 20,000 tons of 20 x 20-inch ingots. There is not much new buying from the regular bar trade for the reason that the mills cannot handle the tonnage for many months, and discourage contracting.

Heavy Specifications

Cleveland, Nov. 2. — Specifications on shapes, plates and bars are very heavy and in some cases they have been filed for the second quarter. Very little contracting is being done at the present time, but at least one company has made some contracts for the second quarter with a few customers. Reinforcing bars of rerolled material are now being quoted at 1.40c in carload lots and 1.45c in less than carload lots, while imple-

(*For complete prices see page* 920.)

ment shapes are being quoted at 1.35c and 1.40c. This difference of price has not heretofore been made as between reinforcing bars and implement shapes.

War Orders Still Heavy

Pittsburgh, Nov. 2.—Buying of steel rounds for the manufacture of shrapnel shells is still active. Numerous inquiries for tonnages ranging from 5,000 to 75,000 tons have come out the last 10 days. Specifications from domestic consumers show snap. Steel bars for domestic consumers are firm at 1.50c. Iron bars are held at 1.60c by some mills.

Tremendous Demand

Youngstown, O., Nov. 2.—Under the press of advancing prices, finished steel buyers are specifying heavily against contracts. Valley makers of plates and bars are months behind on deliveries and are not quoting on inquiries. The demand for steel rounds continues tremendous. Fully 70,000 to 80,000 tons of new inquiry came into the market in the past week. Railroad buying has improved considerably. A large amount of new freight car business is about to come out. The Baltimore & Ohio railroad was in the market this week for 20,000 kegs of spikes and a round tonnage of bars.

Steel Bars Scarce

Chicago, Nov. 2.—The only change apparent in the market for steel bars is increasing difficulty in placing new business, as mills for the most part are practically sold up for the remainder of this year, have little free tonnage to offer for first quarter, and already have booked considerable tonnage for second quarter. As a matter of fact, difficulty is increasing each week in placing business for delivery before July 1 and large inquiries are going begging while consumers are beginning to wonder where they will be able to place their requirements for use during first half. Quotation under such circumstances is practically a nominal process and 1.69c, Chicago mill, is being named as the price in face of the fact that bars are practically unobtainable.

Hard steel bars, rerolled, are now quoted at 1.40c to 1.50c, Chicago mill, following the upward trend of soft steel.

Bar Iron Stronger

Chicago, Nov. 2.—In spite of the advance of a week ago of $2 per ton on bar iron, inquiry for this product remains heavy and some buying has been done at the higher level. Mills, which were operating practically hand to mouth, now have comfortable tonnages and a further advance probably will be made during the present month from 1.45c, Chicago mill, to at least 1.50c, mill. Difficulty in obtaining steel bars is throwing some tonnage to iron bar mills and buyers now are accompanying their contracts with specifications as soon as they are assured they can obtain the tonnage.

Hoops, Bands and Shafting

Pittsburgh, Nov. 2.—Hoops are being held at 1.75c by the Carnegie Steel Co. and bands are commanding 1.50c. Cold rolled steel shafting, quoted at 58 per cent off list, is selling at as high as 56 per cent off the list, in some instances.

Manufacturers of steel chain have advanced prices from 3.05c to 3.20c for ⅜-inch proof coil chain.

Billets High

Some Sales Made for First Quarter—Inquiry From England

Philadelphia, Nov. 2. — One of the important eastern Pennsylvania sellers of semi-finished steel now has opened his books for first quarter and has booked a round tonnage from the regular domestic trade at $40 to $50, mill, for forging billets and at $32 to $34, mill, for open hearth rerolling steel. The spread on forging steel is in accordance with the tonnage, analysis, buyer, etc. Consumers are freely paying these prices and appear glad to have the opportunity to cover their needs. Other large sellers of billets in eastern Pennsylvania are practically out of the market and are declining to quote on inquiries because their output is heavily engaged. In fact, very few makers now are quoting, especially on forging steel. On billets and blooms for the manufacture of shells, up to $60 will continue obtainable. The Pennsylvania railroad has been inquiring for forging billets. British buyers put before eastern mills this week some further inquiries for round tonnages of billets, but these consumers are not offering as attractive prices as now are afforded by the domestic market.

Decided Scarcity

Youngstown, O., Nov. 2.—The stringency in semi-finished steel steadily is becoming more apparent. Bessemer steel is almost as scarce as open hearth. Producers in this district not only have no steel to sell in the open market during the remainder of this year, but also will have little during the first quarter of next. Under the circumstances, prompt quotations cannot be otherwise than nominal. A large amount of domestic business for the first quarter is yet to be arranged, although some producers have covered their regular customers for that delivery. Opinions appear to differ considerably as to first quarter quotations. A few sheet mills, long time customers, have secured open hearth sheet bars as low as $26, Youngstown, but in most instances they are paying close to $29, some contracts having been made at the latter figure.

Consumers are manifesting considerable anxiety as to the possible future of steel prices, and the corresponding effects upon the sheet market. One buyer offers to wager that open hearth sheet bars will sell at $40 a ton before July 1. Nominal quotations for prompt deliveries follow: Bessemer billets, $26; bessemer sheet bars, $27; open hearth billets, $28 to $30; open hearth sheet bars, $28 to $30. Forging billets are quoted in a range from $35 to $39, Youngstown.

Semi-Finished Products Scarce

Pittsburgh, Nov. 2.—It is understood that Youngstown mills have obtained as high as $48 and $55 a ton for billets for the manufacture of war material. Forging billets nominally are listed at a spread from $35 to $45, Pittsburgh. Published quotations for 4x4 billets and sheet bars appear to represent the market accurately. Wire rods are being held at $33 a ton by some mills.

Wire Mills

Are Swamped With Orders—Many Withdraw From Market

Pittsburgh, Nov. 2.—Wire manufacturers literally are swamped with business and most of them have withdrawn from the market for an indefinite period. It is not improbable prices will be put up $1 or $2 a ton this month. Export shipments continue heavy and domestic consumers are buying more freely. Most mills have enough tonnage on their books to keep plants running at maximum capacity through the first quarter of next year.

Vessels Sold.—The Rutland Transit Co., according to a report in New York, has sold the last two vessels of its fleet on the Great Lakes, the RUTLAND and the OGDENSBURG, to the Pacific-Alaska Navigation Co., Seattle. The Rutland line now has disposed of six vessels, which was necessitated by the national act divorcing the lake fleets from the railroads.

(*For complete prices see page* 920.)

Premiums Paid on Plates

For Early Delivery—More Orders for Norwegian and Lake Erie Boats Placed With Lake Yards

Philadelphia, Nov. 2.—Eastern Pennsylvania plate makers now are quoting from 1.60c to 1.65c, Pittsburgh, or 1.759c to 1.809c, Philadelphia, on current business and one mill, which is flooded with orders, has advanced to 1.70c, Pittsburgh, for first quarter. In some cases, prices have been put up to shut off new orders, but even this does not seem to have discouraged buyers, as they still place business freely regardless of the quotations. Early deliveries readily attract premiums. One mill is 10 to 12 weeks behind. Railroad buying has become heavy, and specifications from car and locomotive builders are large. The Pennsylvania railroad bought several thousand tons of plates against a shop requirement of about 10,000 tons. The Baltimore & Ohio is inquiring for several thousand tons for first half and the Southern railway has taken some tonnage for Lenoir City, Tenn. The Maryland Steel Co. has booked two tank steamers for the Standard Oil Co. and is in the market for 5,000 tons of plates for these. Many other boats are in sight. One builder reports he is estimating on work requiring about 12,000 tons of plates.

More Plates for Boats

Cleveland, Nov. 2. — Orders for four additional Norwegian boats, all full Welland canal size, for delivery in 1916, have been taken by the American Ship Building Co. Three will be built at Wyandotte, near Detroit, and one at Chicago. These boats will each require 1,150 tons of steel shapes and plates. A coal barge to be built by the same company, at Detroit, will require 1,075 tons of plates. A 12,000-ton ship ordered by the Franklin Steamship Co., of which H. K. Oakes is manager, will require 4,600 tons of steel. The contracts for the steel, amounting to 10,275 tons for the six boats above mentioned, have been placed with the Carnegie Steel Co. A very important eastern Pennsylvania plate manufacturer which last week was quoting 1.60c, Pittsburgh, on plates has withdrawn all quotations and reports that it is overwhelmed with business. Cleveland companies are quoting 1.60c, Pittsburgh, as a minimum on plates and their plants are very busy.

Shipments Deferred

Pittsburgh, Nov. 2.—Domestic buyers of steel plates are urging mills for shipments, which gradually are becoming more deferred. Specifications from fabricators and car builders involve heavy tonnages. Mills are quoting plates at 1.50c, although some sellers are asking above that figure for nearby delivery.

Plates Are Strong

Chicago, Nov. 2.—Differentials existing for many months between plates on the one hand and shapes and bars on the other have entirely disappeared in the present crowded condition of the market and the same quotation, 1.69c, Chicago mill, is being made on all three products without distinction. Large buying of railroad cars recently, contracting by ship building concerns and a general increase in domesti demand for boilers, tanks and other products involving plates, have conspired to give unusual strength and the plate market has assumed its rightful place with other finished steel products.

Sheet Products

In Very Active Demand—Banner Month of Leading Company

Pittsburgh, Nov. 2.—Pressure for steel sheet products is decidedly heavy. From a standpoint of actual orders, the American Sheet & Tin Plate Co. in October enjoyed the banner month of its history. Advanced prices for first quarter delivery, announced last Wednesday, have been adopted generally. Since that time, the American company has advanced its price of galvanized sheets to 3.70c and 3.80c, base, for prompt and first quarter delivery, respectively. Demand for galvanized material rapidly is approaching normal, but production is restricted by the shortage in the supply of acid and by the high price of spelter and sheet bars. It is not improbable that further price advances will be made within the next fortnight.

Selling for First Quarter

Philadelphia, Nov. 2. — First quarter contracts now are being accepted by eastern Pennsylvania sheet makers on the basis of 1.80c, Pittsburgh, or 1.959c, Philadelphia, for No. 10 blue annealed. Considerable business has been booked. Eastern makers still are able to offer some early deliveries at around three weeks, and 1.85c, Pittsburgh has been done on nearby orders. Contracts are being fully specified.

Mills Crowded

Buffalo, Nov. 2.—Mills occupy the position of being up against the wall, crowded to the limit with demands from old and new customers. With deliveries extended and more orders coming in, the disposition of the producers is to curtail further obligations at prices based upon the existing schedules. The inquiry for sheets for first quarter is large.

Sellers in Control

Youngstown, O., Nov. 2.—It is a "sellers' market" in steel sheets. Abnormal demand for black and blue annealed sheets, together with the scarcity of semi-finished steel has stimulated demand, and makers generally are well booked up for this year. Most makers are quoting extremely cautiously for the first quarter of next year, while a few sellers have not opened their books as yet for that delivery. Quotations on open-hearth black sheets, No. 28 gage, range from 2.25c to 2.30c for first quarter, a sale of a round tonnage having been made at 2.30c, Pittsburgh; on bessemer sheets, for the same delivery, 2.25c represents the market; on galvanized sheets, 3.70c to 3.80c; on blue annealed, 1.75c to 1.85c, sale of a round tonnage having been made at the maximum mentioned.

Automobile makers continue to take heavy tonnages of blue annealed sheets, and other branches of domestic demand for this description as well as box annealed reflect no decrease. A large volume of export inquiry still is coming before makers. Galvanized sheet business still is little better than 60 per cent of normal. If it were near its usual proportions, sheet mills literally would be swamped with business. Prompt quotations for steel sheets follow: Bessemer black, No. 28 gage, 2.10c to 2.20c, Pittsburgh; open hearth black, No. 28 gage, 2.20c to 2.25c; blue annealed, No. 10 gage, 1.70c to 1.80c; galvanized, No. 28 gage, 3.70c to 3.80c.

Stronger at Cincinnati

Cincinnati, Nov. 2.—Demand for sheet bars from the east and for sheets from all parts of this territory has caused an advance of maximum prices on both black and galvanized grades. Black No. 28 gage are now given at from 2.10c to 2.15c, and galvanized No. 28 at from 3.75c to 3.80c, both Pittsburgh basis, for prompt shipment. Mills are refusing to sell

(*For complete prices see page* 920.)

for the first quarter, although that delivery calls for good premiums.

Sheet Demand Good

Chicago, Nov. 2.—Users of sheet steel are taking a normal tonnage and demand is excellent. Sheet mills are somewhat uncertain as to the tonnage they can safely contract, as their supply of sheet bars is not fully assured in the present condition of the steel market, but little difficulty is experienced by buyers in obtaining fair deliveries. No. 28 gage black may be obtained in the Chicago market at 2.29c, Chicago mill, while blue annealed are quoted at 1.89c, Chicago mill. Just what price should be quoted on No. 28 gage galvanized is uncertain under the circumstances. The leading local independent maker consistently remains out of the market, but eastern makers are said to be offering tonnages at 3.79c, Chicago mill. It is hinted that one important interest with its new spelter smelter in Pennsylvania is able to control the market and make considerable difficulty for makers depending on domestic spelter.

Tin Plate Books Not Opened

Pittsburgh, Nov. 2.—Tin plate manufacturers have not yet opened books for 1916 delivery. That material for shipment next year will command $3.40, base box, or above, is predicted by a considerable number of large manufacturers. Specifications against contracts are heavy and it is apparent that consumers will carry some stocks over the end of the year.

Railroads Are Hustling

In Placing Orders for Rails and Rolling Stock— Pennsylvania is Leader in Rails and Cars

New York, Nov. 2.—Heavy purchasing of rails, cars and locomotives is being done by the railroads on all sides. A score or more of different lines now are in the market for equipment and others are preparing plans to come out quickly. The rapid rise in steel prices is forcing the bringing of these matters to a head with short deliberation. Probably 20,000 cars now are pending.

The Pennsylvania railroad in the week distributed its rail tonnage for 1916, amounting to 175,000 tons. This order is one of the largest of its kind in the history of that system and has been equalled in the past 10 years only in 1913, when 183,800 tons were placed. For 1915, the requirements were 167,500 tons; for 1914, 147,000 tons; for 1912, 151,000 tons; for 1911, 111,000 tons, and for 1910, 162,000 tons. Of the order just placed Steel Corporation mills receive 77,000 tons, the Cambria and Pennsylvania Steel companies 38,500 tons each, and the Bethlehem and Lackawanna Steel companies 10,500 tons each. The receivers of the Missouri, Kansas & Texas are about to order 15,000 tons of 85-pound rails. An eastern road has bought 4,000 tons additional, and the Norfolk & Western 3,000 tons from the Bethlehem Steel Co.

In cars, interest attaches to the large inquiry which the Pennsylvania railroad has launched, calling for 9,000 cars, of which 6,000 are for the lines east and 3,000 for the lines west. The Pittsburgh & Lake Erie is about to close for an additional 1,000 gondolas, the Chesapeake & Ohio for 1,000 hoppers and the Delaware, Lackawanna & Western for 500 hoppers. The recent order of the Western Maryland with the Pullman Co., amounting to 1,000 cars, and 1,000 hoppers are about to be placed either with the Pressed Steel Car Co. or with the Standard Steel Car Co. The Central Railroad of New Jersey is reported to have closed on its inquiry for about 2,000 cars.

Among locomotive builders, the Baldwin Locomotive Works has taken 75 from the Pennsylvania railroad, 30 from the Santa Fe, 15 from the Baltimore & Ohio, and 10 additional from the Philadelphia & Reading. The American Locomotive Co. has 10 from the Chesapeake & Ohio, 15 from the Baltimore & Ohio, five from the Minneapolis & St. Paul, two from the Bethlehem Steel Co., and six from the Pekin-Kalyan railroad, of China. The Lima Locomotive Corporation has taken 42 from the Cincinnati, Indianapolis & Western.

The Baltimore & Ohio railroad is inquiring for spikes up to 30,000 kegs for first half. Standard spike makers now quote 1.70c, Pittsburgh, for early specification, and 1.75c, Pittsburgh, for contract.

October was the largest month of the present year in the buying of rails and cars by the railroads, according to the statistics of *The Iron Trade Review*. Rail orders of the month totaled about 590,000 tons, compared with 325,000 tons in September; 160,000 tons in August; 240,000 tons in July; 225,000 tons in June; 140,000 tons in May; 65,000 tons in April; 160,000 tons in March; 150,000 tons in February, and 200,000 tons in January, or a grand total this year of approximately 2,245,000 tons.

October car orders reached about 22,500, compared with 9,000 in September; 3,000 in August; 9,500 in July; 17,000 in June; 18,000 in May; 1,150 in April; 1,100 in March; 4,000 in February, and 2,600 in January, or a grand total since Jan. 1 of about 90,000.

(*For complete prices see page* 920.)

Spikes Advanced

Pittsburgh, Nov. 2.—Railroad spike makers have advanced spikes $1 a ton and now are quoting standard spikes at 1.75c, and smaller spikes at 1.85c, although some sizes are commanding as high as 1.95c. Demand for spikes is active. Steel car wheel manufacturers are deferred three or four months in shipments.

Track Fastenings Higher

Chicago, Nov. 2.—Western mills rolling light steel rails have advanced quotations about $2 per ton. A recent advance by Pittsburgh mills was not followed and a spread of $4 per ton has existed for some time. The present advance is in keeping with conditions and leaves western light rails still about $2 per ton under Pittsburgh prices.

Track fastenings have advanced materially in the past week, railroad spikes being quoted at 1.80c to 1.90c, Chicago; track bolts at 2.25c to 2.40c, Chicago, and tie plates at $34 to $35, Chicago. These quotations are for any delivery to July 1 next year.

Warehouse Prices Advanced

Philadelphia, Nov. 2.—Active buying from warehouse has caused Philadelphia jobbers to make another advance of $2 a ton in store prices which now are quoted at 2.10c, delivered in the Philadelphia district, for plates, shapes and bars. Bar iron is quoted around the same figure.

New Generating Plant.—The International Oxygen Co. is erecting an oxygen and hydrogen generating plant at Verona, Pa., (Pittsburgh district), which will enable the company to make better deliveries in the Pittsburgh district than were possible from its plant at Newark, N. J. Phillip J. Kroll will be manager of this branch.

Small Shapes Are Higher

And Mills Are Falling Behind in Deliveries— Variance in Prices by Different Makers

Philadelphia, Nov. 2.—Smaller sizes of shapes have continued to fall far behind in deliveries with eastern Pennsylvania makers, and these now are the most congested product of the structural market. Some mills are unable to specify their deliveries accurately. Larger sizes, such as 8-inch and over, are procurable in about six to eight weeks. This variance in the position of the mills is reflected in a spread in prices with the highest quoted on the smaller sizes. From 1.70c to 1.75c, eastern Pennsylvania mill, is being quoted on small lots of the latter and in some cases on special extra of $2 a ton has been asked on sizes under 3-inch. For larger tonnages, 1.60c, Pittsburgh, or 1.759c, Philadelphia, is named. Round lots of large sizes command about 1.50c, Pittsburgh, or 1.659c, Philadelphia, which appears to be the market's minimum. Eastern mills, in the main, still are not quoting on contracts, but outside makers have booked first quarter and even first half commitments in this district. The Southern railway bought about 2,000 tons of shapes, largely from an eastern mill, for Lenoir City, Tenn. The Pennsylvania railroad has placed some shapes for cars and the Baltimore & Ohio is buying for first half. The Maryland Steel Co. is out for 4,000 tons of plain material for boats.

Apartment Contracts

New York, Nov. 2.—Higher prices for structural steel appear to be driving to the contracting stage various work in this territory without prolonged negotiations. This situation is demonstrated in apartment house building where a number of contracts are being placed at the present time, which is usually the off-season. In view of the belated mill deliveries on steel, buyers apparently are insuring themselves of early spring shipment by contracting now. The new tonnage is not heavy here, though railroad buying of bridge work is much better. Prices of plain material vary chiefly in accordance with the delivery and range from 1.50c to 1.65c, Pittsburgh, or 1.669c to 1.819c, New York.

Improvements Approved

Cleveland, Nov. 3.—The election in Cleveland Tuesday resulted in the voters approving a number of projects which will eventually call for a large tonnage of structural material, including the Union station, which will be erected at the cost of about $12,000,000; the Barber subway, the Cleveland and Youngstown terminal and extensive grade elimination work. Structural shops in Cleveland are not very busy and will welcome any of the new work which has been authorized by the electors.

Shapes Strong at Pittsburgh

Pittsburgh, Nov. 2. — Fabricating shops in the Greater Pittsburgh district are operating at maximum capacity and some plants are unable to promise deliveries in less than three or four months. The Riter-Conley Mfg. Co. has received contracts for two 450-ton blast furnaces for the Han Yeh Ping Iron, Coal & Coke Co., Shanghai, China, involving about 3,000 tons of steel. Structural shapes are firmly held at 1.50c.

Shapes Become Scarcer

Chicago, Nov. 2.—Structural shape business has been taken in sufficient tonnage to fill the larger mills to capacity for the remainder of the year with a comfortable tonnage extending over into next year, but some smaller concerns are still able to take on some tonnage. The quotation is nominal at 1.69c, Chicago mill, and the difficulty in placing requirements for delivery during the present year is becoming greater each week.

CONTRACTS AWARDED.

Alton state hospital buildings, Alton, Ill., 312 tons, to Decatur Bridge Co.

M. A. Hanna Coal Co. structural steel for three coal handling towers, Superior, Wis., 165 tons.

Two 450-ton blast furnaces for the Han Yeh Ping Iron, Coal & Coke Co., Shanghai, China, 3,000 tons, awarded the Riter-Conley Mfg. Co.

Bridge work for the Boston & Maine railroad, 2,000 tons, to the American Bridge Co.

Apartment house for Bing & Bing, Forty-fourth street, near Lexington avenue, New York City, 500 tons, to the American Bridge Co.

Apartment house for Bing & Bing, Eighty-sixth street and Lexington avenue, New York City, 500 tons, to the American Bridge Co.

Union station, Macon, Ga., 1,500 tons, to the Virginia Bridge & Iron Works.

Maracaro apartment house, 152 West Fifty-eighth street, 400 tons, to the Harris-Silvers-Baker Co.

Holstein apartment house, 110 to 114 East Thirty-second street, New York City, 300 tons to the Belmont Iron Works.

Herzog apartments at Fifty-eighth street and Park avenue and East Eighty-second street, New York City, about 1,200 tons, reported to have gone to the American Bridge Co.

Apartment house for the A. & L. Construction Co., 152-158 West Eighty-sixth street, New York City, 600 tons, to the Hedden Iron Construction Co.

Mishkind apartment house, 106-110 East Eighty-fifth street, New York City, 500 tons, to the Hedden Iron Construction Co.

Apartment house, 102 East Seventy-fourth street, New York City, 500 tons, to the Hedden Iron Construction Co.

Building for the National Folding Box Co., New Haven, Conn., 600 tons to L. F. Shoemaker & Co.

CONTRACTS PENDING.

Duquesne freight station for the Pennsylvania railroad, 800 tons.

Municipal General Hospital, Buffalo, six buildings and boiler house, taking bids, will require about 800 tons. Green & Wicks, Buffalo, architects.

Pier shed for the Baltimore & Ohio railroad, East river, New York City, 350 tons, bids being taken.

Building for the United Gas Improvement, Philadelphia, 200 tons; bids being taken.

Bridge for the Central Railroad of New Jersey, at Allentown, Pa., 500 tons; bids being taken.

(For complete prices see page 920.)

Cast Iron Pipe

Contract for Water Works in Cuba Involves 4,500 Tons

New York, Nov. 2.—The J. G. White Engineering Corporation, New York City, has been awarded the contract for water works construction for the City of Caibarien, Cuba, which includes a pipe line, 37 miles in length and is about to place a contract for 4,500 tons of 4 to 12-inch pipe, which will be a part of this requirement. An inquiry for 2,000 tons of pipe for Arroyo, Porto Rico, again has become active. A local shop took the 3,000 tons of 4 to 24-inch pipe for the City of Detroit at $25.40 for the 4-inch and $24.45 for the other sizes, and John Fox & Co., representing the Donaldson Iron Works, Emaus, Pa., will receive about 1,000 tons of 6 and 8's for Pepack, N. J. The inquiry for 4,000 tons of 18 to 36-inch for Ottowa, Quebec, still is pending. Locally, the market is quiet, as there are very few public offers and private buying is only fair.

Cast Pipe is Higher

Chicago, Nov. 2.—Following strong advances in the pig iron market, the leading interest has advanced its prices on cast iron water pipe 50 cents per ton, making present quotations $28.50, delivered, Chicago, for 4-inch and $26.50, delivered, Chicago, on 6-inch and larger. Light weight water and gas pipe is $1 per ton higher than these figures.

Current business in cast iron pipe is practically nothing, as this is between seasons and buying for next year has not yet begun.

Scrap Prices Are Higher

Decided Advances in Chicago and Market Shows Improvement in Other Centers

Chicago, Nov. 2.—Decided advances have been made in iron and steel scrap in the Chicago district during the past week, some items being $1 to $1.50 higher than a week ago. This advance was brought about by strength in eastern markets and by renewed buying on the part of consumers in this district. Heavy melting steel has sold at $12.50 to $12.75 and inquiries recently have been met with a quotation of $13 although no actual transactions at the latter level are known. Almost every item in the list is advanced 50 cents and some much more.

Railroads are clearing up considerable tonnages which will have the effect of steadying the market and possibly preventing further advances for the time being. The Baltimore & Ohio offers 9,000 tons, including 3,000 tons of long steel rails, 800 tons of No. 1 wrought, 600 tons of No. 2 wrought and 500 tons of car wheels. The North-Western offers 6,660 tons, including 1,000 tons of No. 1 wrought, 1,000 tons of long steel rails and 500 tons of No. 1 cast. The Santa Fe offers 3,185 tons, the Belt Railway of Chicago 625 tons and the C., P. & St. L. 863 tons.

Buying Heavy Steel

Cleveland, O., Nov. 2.—Consumers of heavy melting steel scrap are buying considerable lots of material for future delivery, although dealers hesitate to commit themselves far into the first quarter of next year, under the present market conditions. The prompt market is held in check by heavy shipments to mills, which have caused such a congestion that buyers are not taking on much steel for nearby delivery. Heavy steel is quoted $13 to $13.25, gross ton, Cleveland; $14 to $14.75, valley. Rolling mills report increasing activity, and are becoming better buyers of scrap. No. 1 busheling has been sold at $12 net, which compares with recent quotations of $11.50 to $11.75. Foundries are buying more machinery cast scrap. The iron and steel scrap trade reflects much cheerfulness, and predictions of rising prices are heard in many quarters.

Advances at Cincinnati

Cincinnati, Nov. 2.—Cast iron scrap is gradually gaining in strength, and is now almost as strong as steel scrap. Demand is centered mostly upon No. 1 busheling, No. 1 machine cast, stove plate, heavy melting scrap, machine shop turnings, cast borings and mixed cast, and advances of from 50 cents to $1 per ton have been realized by dealers on all of these in the past few days. Heavy turnings are not very strong, and are unchanged in price at from $6.50 to $7 per net ton. Rolling mills are not buying at present, but are asking for heavy shipments on old contracts.

Gains Ground at Pittsburgh

Pittsburgh, Nov. 2.—Old materials show moderate strength. Consumers are entering the market for future requirements and most grades of scrap have advanced from 25 to 50 cents a ton this week. Heavy melting steel, which sold at $14 a ton most of last month, is commanding as high as $15 a ton. No. 1 wrought scrap is being sold freely for shipment to eastern points. Turnings and borings have advanced about 25 cents a ton each.

More Activity

Buffalo, Nov. 2.—The various yards of the Buffalo district all report an increased activity in practically all of the lines. Low phosphorus steel scrap has advanced 50c per ton to $18 to $18.50; locomotive grate bars have advanced $1 per ton, and increases of 50c per ton have also taken place in No. 1 railroad and machine cast scrap, old car wheels, old iron rails and in No. 1 and 2 busheling scrap.

Better Tone

Philadelphia, Nov. 3.—Small lots of old material are being bought more freely in the eastern Pennsylvania zone and this has imparted a slightly better tone to the market. Consumers, however, still show no keen desire for tonnage quantities and they will not offer such prices as will bring out these lots. Odd carloads of heavy steel are going at $14.50, delivered eastern Pennsylvania. It probably would require offers of $15, delivered, to obtain any larger tonnage. The wrought pipe market is better, as the leading eastern buyer is out with offers of $13.50, delivered, and has placed orders at that figure. Smaller foundries are paying up to $15, delivered, for No. 1 heavy cast, increasing the spread in that grade, since large consumers still are able to fill their needs around $15, delivered. Difficulty to get material has headed off any action on the new inquiry for 20,000 tons of steel scrap for Italy.

Drifting at New York

New York, Nov. 2.—The scrap market has not shown any appreciable change in orders or prices in this territory, although the general tone is slightly better. Cast scrap is fairly active and firm. In the other tonnage grades, the offers of consumers ars not sufficient to tempt sellers except for miscellaneous lots. The market is neither strong nor weak; it appears to be simply drifting.

Demand is Strong

St. Louis, Nov. 2.—The demand for scrap continues very strong, with indications that prices will be further advanced. Local industries are operating to capacity, and are coming into the market to replenish their depleted stocks. The fact that Colorado Fuel & Iron Co. has taken 10,000 tons of miscellaneous steel out of this market also is a big factor in the recent advance in all grades.

The only railroad list out this week is one for 10,000 tons by the Baltimore & Ohio, very little of which will move into this market.

(For complete prices see page 920.)

Federal Furnace Co.

Is Absorbed by the By-Products Coke Corporation

Chicago, Nov. 2.—The Federal Furnace Co., South Chicago, Ill., has been absorbed by the By-Products Coke Corporation and will be dissolved. The Federal Furnace Co. has owned and operated two blast furnace stacks at South Chicago and the By-Products Coke Corporation has operated a coke plant at the same place.

The terms of the merger provide that stock of the Federal Furnace Co. shall be exchanged for that of the other corporation on the basis of three-fourths of a share of the coke stock for each share of the furnace company's capital. The coke stock is now selling in the local market at about 145.

No change will be made in the selling arrangements for Federal pig iron, which will continue to be handled by Pickands, Brown & Co., McCormick building, Chicago.

W. L. Brown and Donald Boynton respectively president and secretary of the Federal Furnace Co., have been directors of the coke company and will continue in that capacity.

Outstanding stock of the Federal company is $1,785,000.

Season's Iron Ore Sales

Make a Large Total—Shipments for October Were Heavy—Vessel Yards Busy

Cleveland, Nov. 2.—Sales of iron ore for the year, with those for a few mines estimated, have been as follows:

Range.	Tonnage.
Mesabi	29,273,772
Gogebic	5,458,605
Marquette	4,059,648
Menominee	4,729,914
Vermillion	1,645,802
Cuyuna	1,205,000
Baraboo and Mayville	170,000
Canadian (To U. S. only)	125,055
Total	46,667,796

The statistics of ore shipments for the season to date show that it will not be difficult to move the ore which has been sold. It is probable that the all-rail shipments will amount to about 1,000,000 tons. Beyond the general expression of opinion that ore prices will be higher for next year, there has been no discussion, and ore sellers hope there will be none until market conditions become more clearly defined.

Ore shipments during October were 7,146,875 tons, making the total movement to Nov. 1, 41,816,439 tons.

IRON ORE SHIPMENTS.

Port	October 1914.	October 1915.
Escanaba	421,341	928,399
Marquette	265,861	522,671
Ashland	487,829	866,170
Superior	1,442,216	1,351,893
Duluth	918,144	2,301,352
Two Harbors	707,001	1,176,388
	4,242,392	7,146,873
1915 Increase		2,904,481

Port.	To Nov. 1, 1914.	To Nov 1, 1915.
Escanaba	3,440,992	4,940,081
Marquette	1,651,579	2,836,203
Ashland	3,229,746	4,695,752
Superior	10,920,469	7,348,916
Duluth	6,197,043	14,108,571
Two Harbors	5,511,976	7,886,916
	30,951,805	41,816,439
1915 Increase		10,864,634

During November of 1913, 3,270,958 tons were moved by the fleet, so that if it moves the same amount this year the season's movement will exceed 45,000,000 tons. The fleet will unquestionably move more than that during the remainder of the season, as the December movement in 1913 was only 1,411 tons, whereas there has already been lined up a considerable movement for December during the present year. It will therefore not be surprising if the total movement during the present year approximates 47,000,000 tons.

Lake shipyards have about lined up all the work they can promise to deliver next spring. Altogether 26 vessels are under contracts in lake yards, ten with the American Ship Building Co., seven with the Great Lakes Engineering Works, four with the Toledo Ship Building Co. and five with the Manitowoc Ship Building & Dry Dock Co. Of these 26 vessels, seven of them are bulk freighters, of which four are 600-footers. Repair work also will be more extended than was at first thought.

Low Phosphorus Bought

Philadelphia, Nov. 2.—Purchases of about 60,000 tons of low phosphorus ore have been made by a leading eastern Pennsylvania maker of this grade of iron. Of these about 50,000 tons represents the total output for 1916 of a Cuban miner of this class of mineral and about 10,000 tons are Spanish ore or the two cargoes previously noted as having been offered at 10 cents per unit of iron at tidewater. The price paid for the Cuban ore has not been announced, but it is known to have been at the highest level in several years owing to the record-breaking prices of low phosphorus pig iron. The Bethlehem Steel Co., which has had four cargoes of Chilean ore stalled in the Panama canal because of the slide, now is bringing in these shipments around Cape Horn.

Donner Exercises Option

And Obtains Control of Pennsylvania Steel Co.—Closer Relations With Cambria—Final Plans Not Announced

Further announcement now is awaited as to the final disposition and operation of the Pennsylvania Steel Co., the control of which, it is officially stated, passed in the week to W. H. Donner, president of the Cambria Steel Co., and his associates, by their exercising an option on one-half of the holdings of the Pennsylvania railroad, which has been in their hands for some time. Other stock acquired outside by this syndicate has given it control, although the Pennsylvania railroad and the Reading railroad interests still retain heavy holdings. The Pennsylvania railroad interests have been the holders of 97,460 shares of the outstanding issue of 205,608 shares of preferred and of 73,889 shares of the outstanding issue of 107,500 shares of common, all of the par value of $100. All of this was held by the Pennsylvania Co., with the exception of 5,877 shares of preferred stock which was the property of the Pennsylvania Railroad Co. The Reading Iron Co. is the owner of 70,922 shares of both common and preferred. While no official statement has been made regarding the price, it is understood it was around $85 a share for the preferred and $37 a share for the common.

In addition to the purchase of the Pennsylvania Steel stock, Mr. Donner's syndicate has closed an option for a portion of the Pennsylvania railroad's holdings in the Cambria Steel Co. It is reported this amounted to about a quarter of the railroad's holdings, or approximately $5,000,000 par value. The options on both the Pennsylvania Steel Co. and the Cambria Steel Co. stock were given Mr. Donner when he became chairman of the Pennsylvania Steel Co. about two years ago. Recently Charles M. Schwab made an offer for control of the Pennsylvania Steel Co., planning to take the option off Mr. Donner's hands. At one time, it was thought the deal would be closed, but an agreement finally could not be reached on terms and the result was Mr. Donner closed his option.

The steel trade long has heard that the Cambria and Pennsylvania Steel companies eventually would be amalgamated, if this were proved to be feasible from present legal or business standpoints, since there has been practically identical management for some time. Mr. Donner has been serving both as chairman of the Pennsylvania Steel Co. and president of the Cambria Steel Co. It is now believed some plan will be carried out whereby the two companies will be more closely related in operation and management, but just how this will be worked out is a matter of which no announcement yet has been made.

If the Cambria and Pennsylvania Steel companies can be combined into one enterprise, it will represent the most extensive independent steel organization of the country. It would comprise 19 blast furnaces, about 50 open hearth furnaces, three bessemer plants, three rail mills, wire, merchant bar, structural, plate and other finishing plants.

(*For complete prices see page* 920.)

Automatic Machine Development

How the "Automatic" Has Been Applied to Various Machining Operations—Its Relation to Quantity Production

BY RALPH E. FLANDERS

THE term automatic is a relative one in its general use. From an early period, lathes and, later, drilling machines have been provided with self-actuating feeds. They are thus automatic to that extent. It is not so many years ago that the term disappeared from descriptions of ordinary machine tools. As self-actuating feeds became the rule rather than the exception, something more was required to justify the use of the term. It has of late years only been applied to machine tools in which practically all the movements are self-actuating.

What "Automatic" Means

Thus not the feed motion alone, but the return of the tool to its starting point, the bringing of new tools into position for cutting, the changing of speeds and feeds, and the starting and stopping of the machine, are among the features which entitle a machine tool to be called "automatic" in the present meaning of the word, when these various functions are self-performed by the mechanism, without any interference by the operator after the preliminary adjustment. In extreme cases of automatic action, the mechanism also measures the work and adjusts the cutting tool, inserts the work in the machine and removes it after completion, and even transfers the work automatically from one machine to another. In American shop parlance, the term "automatic," used as a noun, has a more restricted meaning than given above. It usually denotes a machine belonging to the lathe family, such as an automatic screw machine or turret lathe. Particular attention will therefore be given to these machines, after first reviewing progress in the broader field. Descriptions will be given of certain machines selected to illustrate the various types of automatics.

Presented at the International Engineering Congress, San Francisco, September, 1915. The author, Ralph E. Flanders, is manager, Jones & Lamson Machine Co., Springfield, Vt.

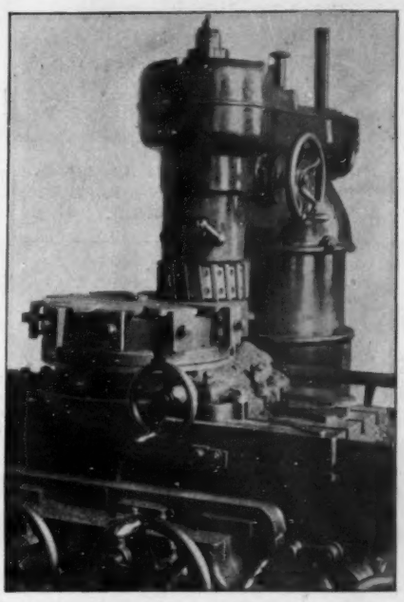


FIG. 1—BROWN & SHARPE VERTICAL MILLER

Automatic Action Applied to Standard Tools

The punch press is often equipped with an intermittent roller feed, for cutting out and forming work from a continuous strip or ribbon of metal. The machine operates continuously and without attention until the stock is all used up, and thus furnishes an example of true automatic action. A later development is the application of the "dial feed" to the punch press, in which an intermittently rotating disk or dial carries the blanks to be operated upon, to the die, or even through a series of dies, so that complicated punchings, forming and drawing operations may be performed in one machine. The operator's duty is to keep

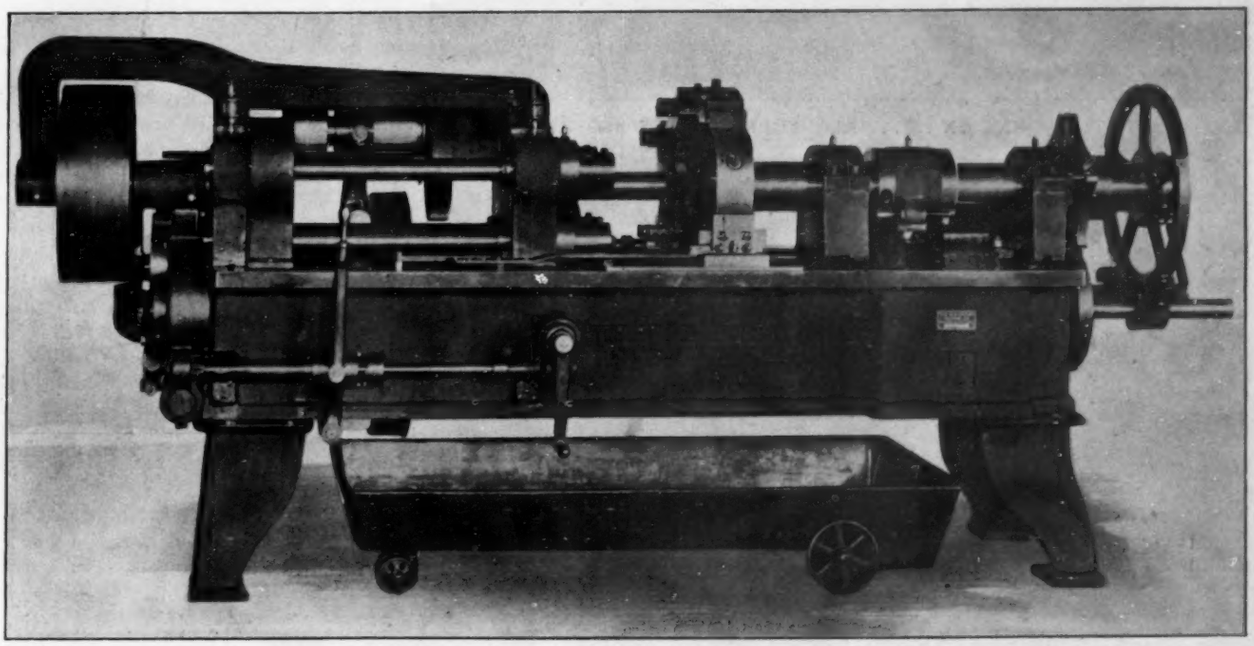


FIG. 2—NEW BRITAIN AUTOMATIC MULTIPLE-SPINDLE MACHINE FOR DRILLING, TAPPING, AND COUNTERBORING ON SMALL WORK

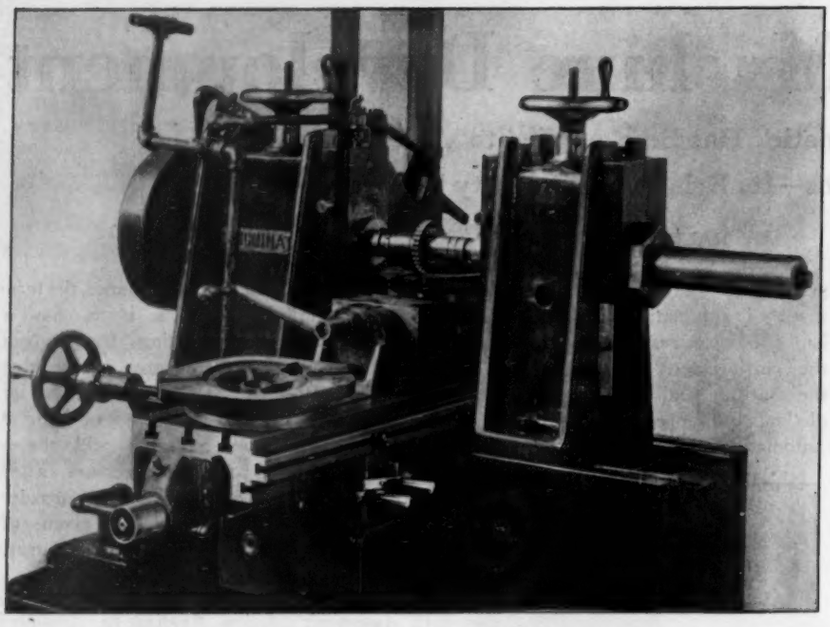


FIG. 3—CINCINNATI AUTOMATIC MILLING MACHINE. FEED IS AUTOMATICALLY SPEEDED UP WHILE CUTTER PASSES OPEN SPACE IN CENTER OF WORK, SHOWN AT END OF WORK TABLE

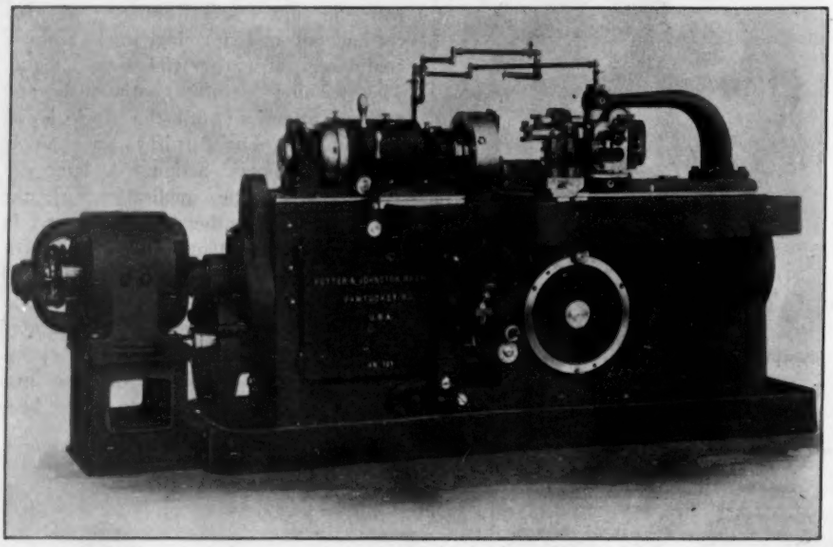


FIG. 4—POTTER & JOHNSTON AUTOMATIC TURRET LATHE FOR LARGE WORK

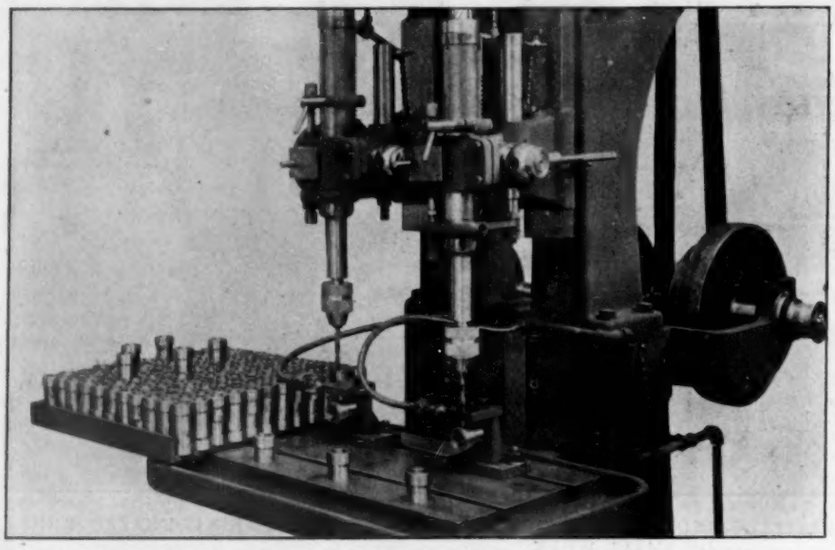


FIG. 5—AVERY DRILL WITH AUTOMATIC FEED; ALL MOTIONS SELF-ACTING AND OPERATOR DOES NOTHING BUT CHANGE THE WORK

the dial supplied with blanks. The machine itself usually ejects the finished work. With the dial feed, the operator can often, and with the roller feed usually, tend more than one machine. In addition, there is the advantage of safety in operation over hand feeding.

An interesting case of automatic action in this class of machinery, is the equipment furnished for making tin cans for preserving fruits and vegetables. Here the sides and covers are cut out, formed, fluxed and soldered together practically without the assistance of the operator, although attendance is required for inspection of the finished work and adjustment of the mechanism. This is an example of the extreme case of automatic mechanism, in that the equipment comprises what is really a group of machines, with mechanism for carrying the work from one machine to another and assembling the separate parts into the complete product.

Vertical Milling Machine

An important recent development in milling is the use of the vertical milling machine with a continuously rotating table, as shown in Fig. 1. This table is provided with a series of fixtures about its periphery, holding a circular row of pieces to be milled. These pieces are located close together, so as to make the surface to be finished as nearly continuous as possible. The operator stands in front of the rotating table, takes out the finished work as it leaves the cutter and replaces it with work to be machined. The mill thus cuts without intermission, there being no stopping and running back of the table to change the work.

A recently developed automatic milling machine is shown in Fig. 3. In the form shown, it is a modification of the Lincoln type of miller, largely used in the interchangeable manufacture of small arms, typewriters, sewing machines, etc. It is also furnished as a single or double-head face milling machine. The automatic feature is the control of the longitudinal feed of the table. By an ingenious arrangement of stops and connected mechanism, it may be set for any one of the following series of movements:

(*a.*) Table feeds rapidly until cutter approaches, then slows down to cutting feed, either stopping at end of cut or returning quickly to starting point as desired.

(*b.*) Same as *a* except that fast motion may be thrown in momentarily to carry the cutter past open spaces where the surface to be milled is intermittent instead of continuous.

(*c.*) With work held in vise or fixture at each end of table, table moves rapidly until cutter approaches work, then slows down to cutting feed, stop-

ping at end of cut; meanwhile work has been changed at other end of table. A touch of the control lever runs the table rapidly back until cutter approaches work at other end, then the slow feed throws in until the completion of the cut, when the feed stops. Meanwhile the work at the first end of the table has been changed, and the cycle is repeated. Various other combinations are possible. This mechanism permits increase of output by the reducing of idle time, by saving the operator from fatigue, and sometimes by permitting him to run more than one machine.

A more elaborate automatic milling machine has recently been brought out by Potter & Johnston, in which two complete work tables are provided. The work on one of these tables is being milled while that on the other is being changed. At the conclusion of the cut the tables change places. Milling is thus practically continuous.

Automatic Drill Press

Automatic control applied to a light drill press is illustrated in Fig. 5. The design of this mechanism is such that the machine may be operated fully automatically, semi-automatically or as a plain hand-feed machine. In the full-automatic type, all the movements of the spindle are automatic. All the operator does is to change the work between strokes, operating as many spindles as the nature of the work will allow. The semi-automatic is that type in which the tripping of the feed and the return of the spindle is automatic, but the feed must be re-engaged by hand. Here the operator needs time to arrange his work under the spindle. When ready, he re-engages the feed and goes to the next spindle doing the same, and so on for as many spindles as he can take care of. Each spindle in turn drills to the pre-arranged depth, trips, returns and stops. The plain hand-feed is obtained by merely throwing out the automatic features. When the automatic, or semi-automatic feed is in use, the feed is by worm and worm wheel, and the quick return is by weight, checked by an air dash-pot at the top of the stroke. Quick-acting jigs are necessary for getting the full advantage from a machine of this type. The number of spindles an operator can keep going is limited only by the rapidity with which he can change the work. Convenience in the supply of work is also a factor. Both points are well illustrated in Fig. 5.

Gear-cutting machines, completely automatic except for changing the work, have been in use for many years. The developments of the past decade in this line consists in the extension of automatic action to the generating of bevel gears, and to the development of various new methods of gear cutting, in

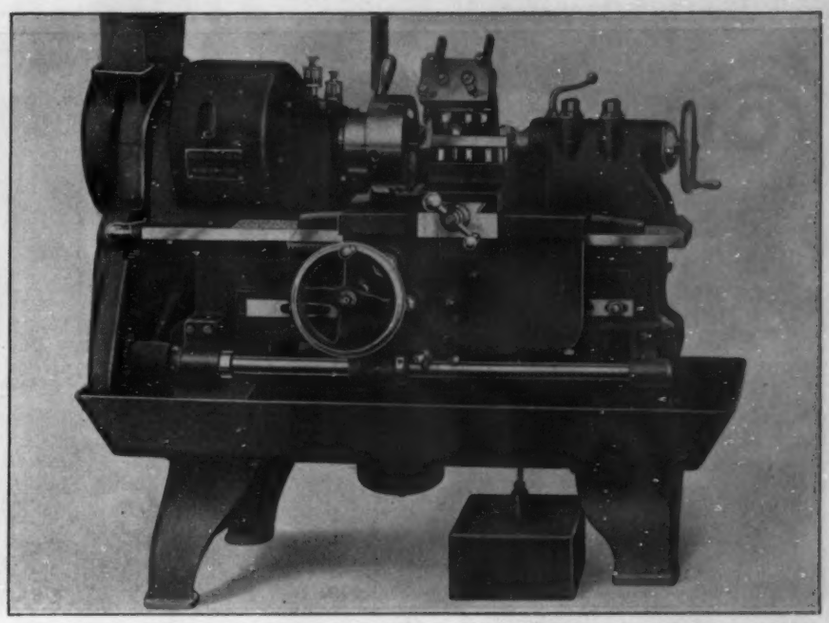


FIG. 6—REED-PRENTICE AUTOMATIC LATHE FOR SECOND OPERATION WORK

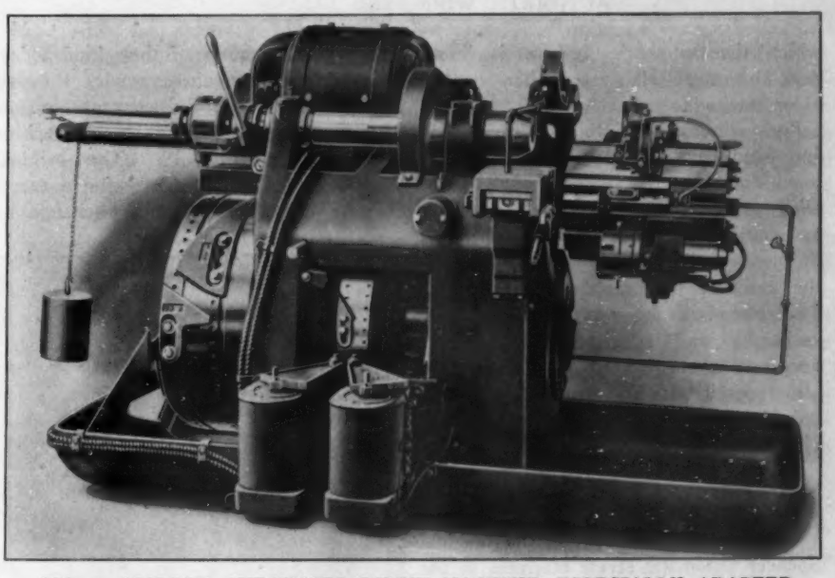


FIG. 7—GRIDLEY AUTOMATIC SCREW MACHINE, ESPECIALLY ADAPTED FOR MAKING BOLTS, STUDS, AND SHORT SHAFTS

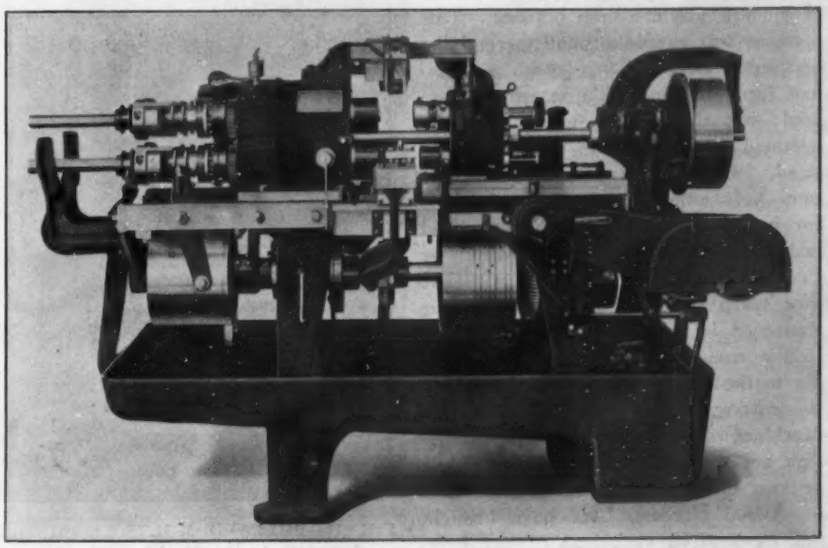


FIG. 8—NATIONAL-ACME MULTIPLE-SPINDLE AUTOMATIC WITH FOUR TOOL POSITIONS ALL WORKING SIMULTANEOUSLY ON FOUR BARS OF STOCK

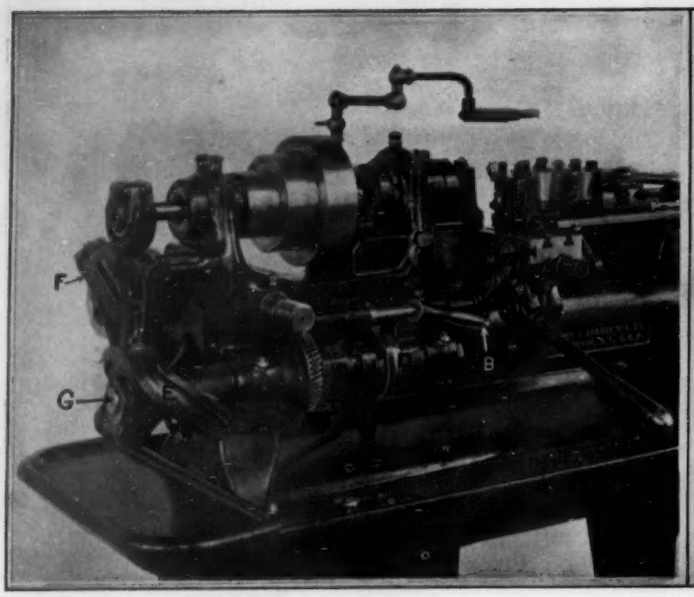


FIG. 9—BROWN & SHARPE HAND SCREW MACHINE WITH AUTOMATIC WIRE FEED

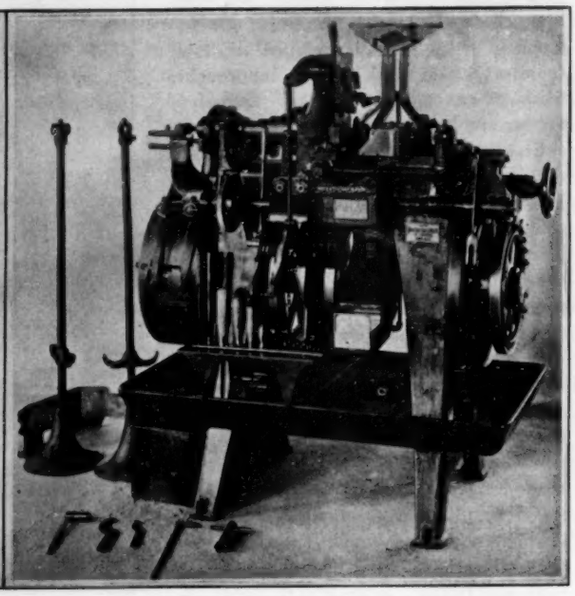


FIG. 10—DAVENPORT AUTOMATIC ASSEMBLING MACHINE

which the automatic feature is, however, no more elaborated than in the older methods.

For cylindrical grinding of small pins and studs in large quantities, various manufacturers have occasionally supplied grinding machines with complete automatic control. The operator places the work in a hopper or magazine, as the machine is completely self-feeding. The attendant inspects the work occasionally and adjusts the wheel as necessary to compensate for wear. He also trues it with the diamond when required. Otherwise, the grinder is completely self-acting.

Automatic Screw Machines

With the introduction of the original Spencer automatic screw machine, in the early eighties, began the extensive use of "automatics" as an important factor in modern machine-shop practice. This machine was simply a small turret lathe or "screw machine" fitted with a modified form of the Parkhurst wire or rod feed; but the various motions usually operated by hand were controlled, instead, from various cams on a single cam shaft, extending under the machine for its whole length. Changes on feed and length of cut were made by changes in simple strap cams. The time taken for the idle movements was shortened by giving a quick movement to the cam shaft, automatically changing to the slow feeding movement when the cutting tools approached the work. Machines of practically the original design are still in successful use, and one or two firms, notably the English firm of Alfred Herbert, Ltd., have brought out modernized variations of the original design, which rank with the most successful machines of their kind today. A recent American example, showing descent from the Spencer machine, is the Hartford automatic screw machine illustrated in Fig. 19. The original standard turret is changed for a turret of the barrel type, and the change of feeds is facilitated by the multiple-track cam, which is shown beneath the turret. The first machine to break away from the Spencer type was the Brown & Sharpe shown in its latest form in Fig. 14. This automatic employs disc cams, which are usually special for the particular piece being made. Unlike the Spencer machine, these cams have a rotating motion at continuous speed, all the idle movements being operated by intermittent clutch connections with a fast-running lay shaft. The machine is notable owing to its accuracy, and to the quickness of its motions—an important point in small work. It has been built in great numbers and is familiar to all screw-machine specialists. The machine illustrated is of the single-pulley drive type. As is the case with most of the modern machines, it may be fitted with various automatic attachments for milling, cross milling, screw slotting, etc.

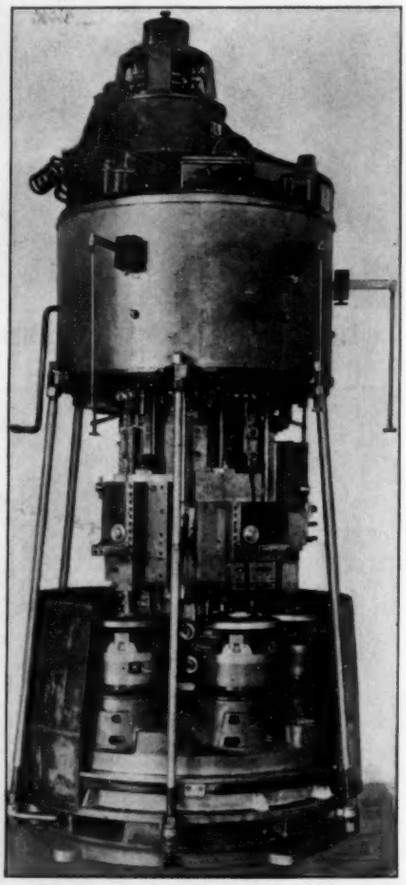


FIG. 11—BULLARD MULTIPLE-SPINDLE VERTICAL MACHINE FOR TURRET LATHE WORK

Development of Screw Machine

The original field of the automatic screw machine was, as its name implies, the making of screws. This was quickly enlarged to take in the making of all varieties of small nuts, washers, pins, collars, etc. The Gridley automatic, shown in Fig. 7, may justly claim to have led in the further extension of the field to the making of studs, shafts, etc., of several inches in length. The turret is of the drum type, with the tools mounted on long slides on its periphery. This permits long feed movements and the mounting of two or more tools in tandem. Machines of this type are doing a class of work that could previously only be handled on the small engine lathe, or on that type of

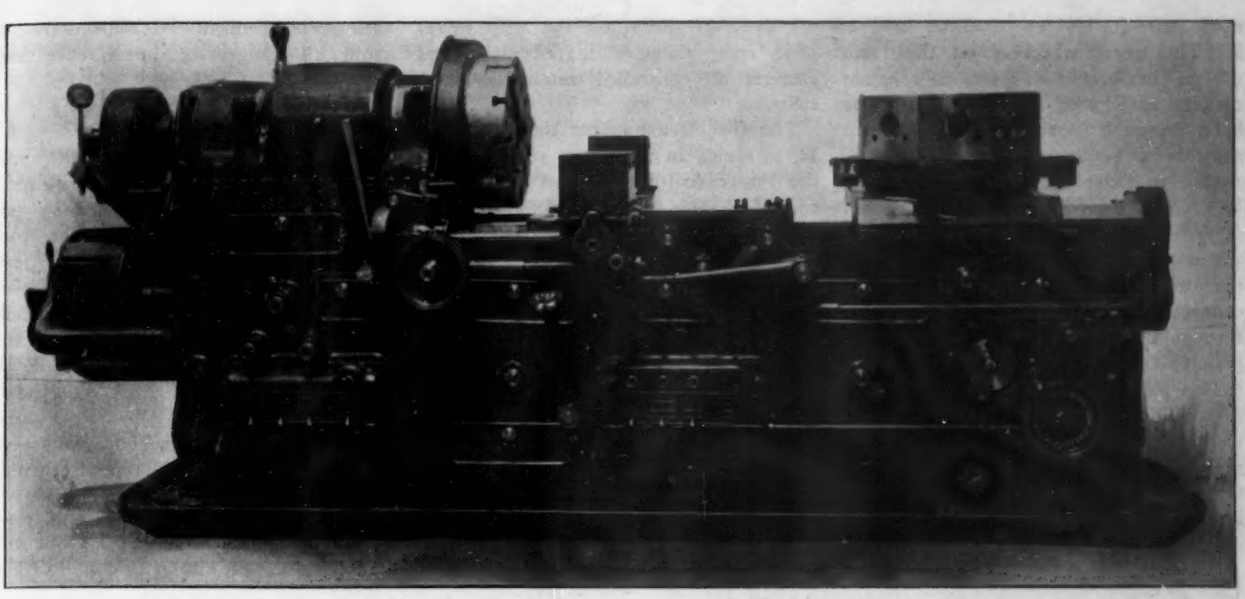


FIG. 12—GISHOLT AUTOMATIC TURRET LATHE

turret lathe which is particularly designed for the performance of bar work. While the machines just described have broadened the field of the "automatic," there has been another line of development which has greatly increased production in those classes of work for which screw machines were first used. This is the multiple spindle automatic screw machine, of which the National-Acme design is shown in Fig. 8. In this machine the turret is dispensed with, and its place is taken by a tool holder which feeds forward four or more tools to operate on bars of stock held in the same number of opposing work spindles. It is a drum or carrier containing these spindles which "indexes", instead of the tool holder or turret.

Sequence of Operations

After the tool holder has concluded its working stroke and retired, the work spindle carrier is revolved, bringing each bar of stock to the next tool in rotation. The final tool position provides for a cut-off blade, and a complete piece is finished and cut off at each indexing. One or more forming slides are also provided at different positions.

With this machine, of course, all the cutting tools are working on each feeding stroke, as each has a bar of stock presented to it, instead of having to wait its turn on a single bar of stock. The Gridley multiple spindle automatic is another well known machine of this type.

Among the other makes of multiple-spindle automatics, the Davenport machine, shown in Fig. 16, may be mentioned. It is designed to combine the high output of the multiple-spindle machine with the accuracy of the high-grade single-spindle on small, close work. It also provides for separately adjustable feeding movements for the different tools, instead of feeding them all forward together in the same holder; thus tending to increase the output. For ordinary work, the adjustments provided permit standard cams.

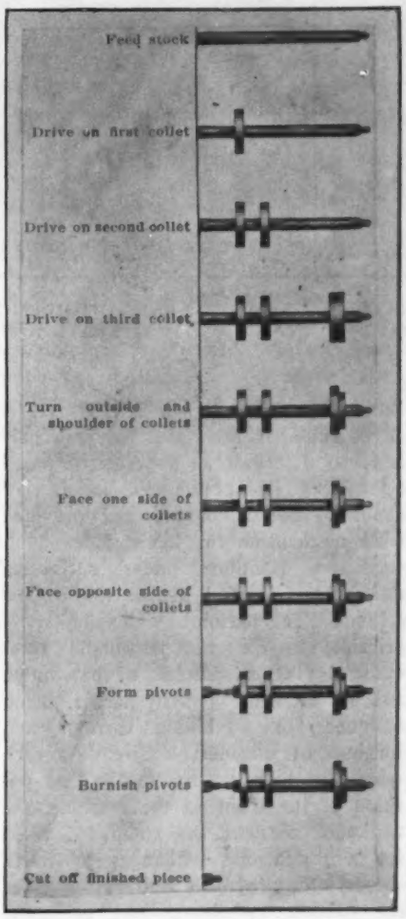


FIG. 13 — ORDER OF OPERATIONS ON MACHINE SHOWN IN FIG. 10

While this paper does not treat particularly of problems of mechanism, it will be worth while to note the various ways in which these problems have been attacked. The various forms of control that have been used for automatics are the following:

First—Direct cam control as shown in Figs. 2, 4, 7, 8, 15, 19 and 20.

Second—Cam control for feeds, and lay-shaft control for fast motions as shown in Figs. 9, 10, 14 and 16.

Third—Lead-screw control as shown in Figs. 6, 11 and 12.

Fourth—Hydraulic control as shown in Fig. 18.

Fifth—Pneumatic control, in various small watchworking machinery, and applied experimentally to larger automatics.

Set-Up and Cut Methods

In changing feeds for different set-ups and different cuts in the same set-up, the following methods are in use.

First—Changing the cam, as in Figs. 2, 4, 7, 8, 14 and 15. In all these cases, however, the whole cycle of operations can be accelerated or retarded by changing gears.

Second—Changing gears for separate operations, in Figs. 11 and 12; or changing a friction drive, in Fig. 20, such changes being made automatically.

Third—Setting adjustable link motions, in Fig. 16.

Fourth—Changing capacity of pump, in Fig. 18.

Of these various schemes, that of the "lay shaft" is perhaps the only one that requires special explanation. A simplified application of this principle is shown on a Brown & Sharpe auto-

matic wire-feed screw machine in Fig. 9. The worm wheel *A* on the front of the headstock is given a constant rotation at a good rate of speed. The hand lever *B* operates a trip, which controls a single revolution clutch *C* similar to those used on punch presses. When this lever is operated, cam-shaft *G* is given a single revolution by worm wheel *A*. The attached cam *D* operates the chuck through an interior connection, while cam *E* feeds the stock through the link motion *F*, which is adjustable for the desired length of stock.

This principle of the lay shaft makes it possible to execute the idle movements with the greatest rapidity, leaving the slow-moving cams to control the feeding motions only. While shown in use in Fig. 9 on a hand machine, it finds a more complete use in the automatic machines in Figs. 10, 14 and 16. It is, in general, a somewhat more complicated scheme than the simple cam-operated arrangement, but is less complicated than the lead-screw type of control.

Automatic Turret Lathes

The Potter & Johnston automatic, shown in Fig. 4, deserves the credit of opening up the field of chuck work for automatic operation. While the automatic screw machine had been adapted in particular cases to the machining of small castings, such as sewing-machine balance wheels, there had been no serious attempt to use it in the general run of small and medium-sized forgings, castings and chunk stock. The machine is a turret lathe in the strictest sense of the word, but with turret slide, cross slides, and feed and speed changes all controlled automatically by cams.

The Gisholt automatic, shown in Fig. 12, is tooled in much the same way as the Potter & Johnston, and is intended for the same class of work. The mechanism is entirely different, however, as most of the movements are controlled by lead screws instead of cams.

The multiple-spindle screw machine already has been discussed. Paralleling this development in the screw machine, there has lately been a corresponding activity on the part of turret lathe designers, resulting in what, for want of a better name, may be called a multiple-spindle automatic turret lathe. The Bullard machine, shown in Fig. 11, is an example of this type. It may perhaps be described as a series of small boring-mill tables mounted in a ring about a central column, and provided with mechanism for being indexed to successive positions under successive tool holders carried at the top of the column. The machine, while similar in principle to the multiple-spindle automatic, is vertical instead of horizontal, and is, of course, vastly larger, being designed for machining castings and forgings of considerable size. As each spindle or table returns to the first position at the front of the machine, the workman changes the completed piece for a rough one. Changes in feeds, speeds, etc., are made automatically for the different positions, and particular care has been taken to so interlock the various independent mechanisms as to avoid all danger of interference and breakage.

Hydraulic Control

The Conradson machine, while similar to the one just described in its general arrangement, is controlled by entirely different mechanism. The tool and work movements are similar, except that the Conradson machine uses side heads for facing, whereas the Bullard machine gives a cross feed to the regular tool holder. The control of the machine shown in Fig. 18 is, however, almost entirely by hydraulic pressure, oil being the medium employed. The feeding is by a differential scheme; the pressure for the return motion is on continuously, but is over-balanced by a pressure on a larger piston area for the forward movement. This arrangement is employed to give firm control and absence of backlash to the various movements.

The New Britain automatic, shown in Fig. 2, is an older machine for somewhat similar, but smaller work. It is horizontal, and particularly adapted for such operations as drilling, counterboring, facing, tapping, etc., the work being stationary while the tools revolve. The work is held in a series of vises or fixtures on an indexing plate, there being one station always free of tools, for changing work. This machine is also made in a double type, in which work is clamped in the middle and presented for tool operation on both sides. There is still a further line of development which has resulted in what

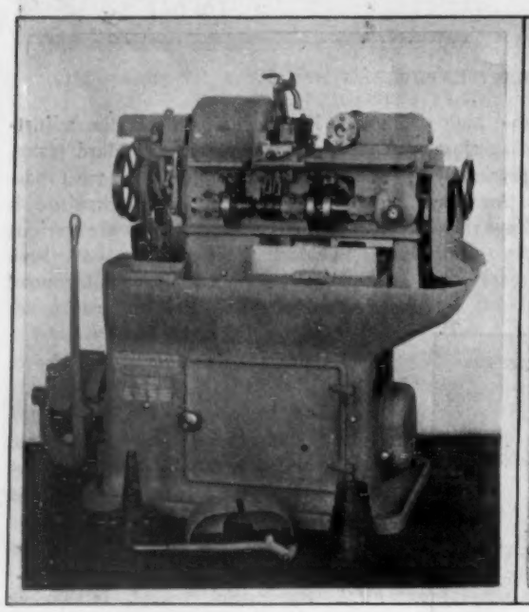


FIG. 14—BROWN & SHARPE AUTOMATIC SCREW MACHINE—ALL CONNECTIONS ARE CONTAINED IN BASE

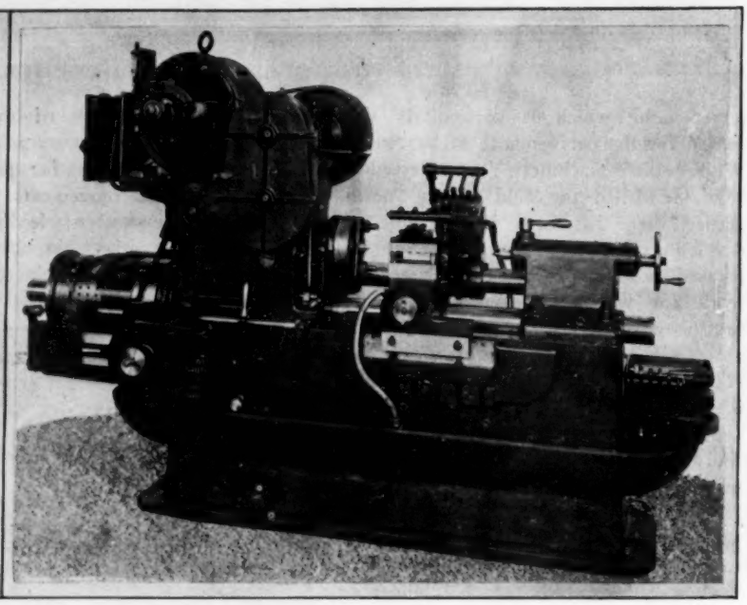


FIG. 15—FAY AUTOMATIC LATHE FOR FINISHING SECOND OPERATION WORK HELD ON ARBORS

may be called, strictly speaking, the "automatic lathe". This type of machine has headstock and tailstock similar to the standard engine lathe, but with carriage and supplementary facing and forming tools automatically controlled. The original machine in this field is the Fay automatic lathe, shown in Fig. 15. It is used for rough forgings which may be held on centers, such as automobile steering knuckles; but its principal use is for work held on an arbor. It is thus a second-operation machine, completing work that has previously been chucked and otherwise partly finished on the drill press or turret lathe. The machine is cam actuated, and provision is made for taper and form turning and bevel facing. The operator changes the work on an extra arbor while the machines are running, thus reducing the idle time of the

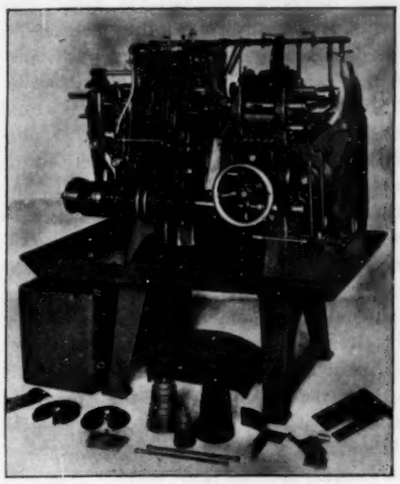


FIG. 16—DAVENPORT MULTIPLE-SPINDLE AUTOMATIC

machine to a minimum. The turning tools relieve automatically in the return stroke, so as not to score the work, and the machine stops itself at the conclusion of the cut. By using all the tools the work will stand, and by putting two or more pieces of work on the same arbor, when possible, a high rate of production may be obtained. There is also the advantage of the accuracy which is a result of second-operation work on a true arbor, between true centers.

Another somewhat simpler machine for simple work of the same class is the Reed Prentice automatic lathe, shown in Fig. 6. This lathe is also intended particularly for continuous running on the same work, without change of speeds or feeds. Instead of using cams, the feed is by regular lathe-apron mechanism, released at the end of the cut and returned quickly by a weight. The foregoing descriptions by no means include all the automatics in regular and successful use at the present time. Space limits and the intended scope of the paper do not permit a complete description and classification. The machines shown were selected for their value as illustrating various standard types, thus giving a ground work for the following general description.

Tendencies in Design

From what has been said, it will be seen that the first step from the hand-controlled machines, was in the direction of comparatively simple single-spindle machines, which were afterwards refined to give greater accuracy and output. The next step was the application of the multiple-spindle idea. This was tried first for work in which great accuracy is not essential, owing to the difficulties introduced by the multiplicity of bearings, and particularly by the great accuracy required in the indexing of the multiple machine. As expert attention has been more and more applied to these points, the multi-spindle machine has been found better adapted to work of the best quality.

As an example of this line of development within the walls of a single shop, the case of one of the largest watch factories in the country may be cited. The turning of watch staffs was originally done in hand-controlled lathes, one lathe being set for one diameter, the next for the next, and so on. The sequence of cuts was carefully arranged so that the work should not be sprung by the cutting pressure in any operation, but should come out running true on all the various diameters. This requires frequent reversing of the work in changing from one cut to another. The next step was one which was comparatively simple, in itself, but marked a great advance in economy of production. A complete equipment of lathes for finishing one staff was arranged in order on one bench, and automatic means provided for transferring the work from one machine to another, turning it end for end in transit, when necessary. All the machines in the row are thus simultaneously at work, each on its own cut.

At the conclusion of all the cuts, a series of transferring arms comes into play, moving each piece of work simultaneously to the next machine in order, putting a fresh blank in the first machine in the line, and depositing the staff from the last machine in the tray for finished work.

In a similar way, processes were developed for drilling, tapping, counterboring and recessing the watch plates. First, simple hand-controlled machines; next, automatic machines, automatically fed from magazines. Then a row of such machines, with transfer arms carrying the plates from one to another. Such machines represent the highest point of development in single-spindle automatic design; with proper grouping they give, in fact, about all the advantages of multiple-spindle design, with the added advantage of great simplicity in the design of the separate units. Recent tendencies in this plant have been in the direction of the multiple-spindle principle for a considerable portion of the work.

As an example of the grouping in one machine of unrelated operations, the case illustrated in Figs. 10 and 13, is interesting. This is the Davenport automatic assembling machine for assembling and finish-turning lantern pinions for clocks. It is a combination of automatic screw machine, press and staff lathe. The staff is made from a

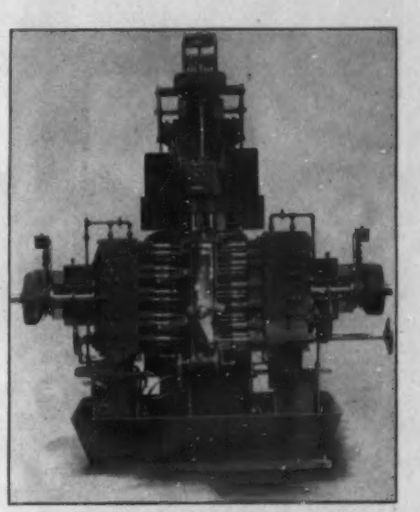


FIG. 17—SPECIAL FOOTE-BURT AUTOMATIC MACHINE FOR DRILLING A PARTICULAR PIECE OF WORK

wire or rod in the screw machine spindle, and the various collets are carried in magazines on the turret and pressed on to the staff in the proper location. They are then turned and faced in position so as to run true, the pivots are formed and burnished and the completed pinion blank is cut off. This is a good example of the elaboration that is profitable in many kinds of work where continuous operation on the same piece can be obtained.

Considering only the "automatic" in the limited sense in which it is used in the American machine shop, we have seen the following stages of development:

First—The hand-operated engine lathe.

Seond—The hand-operated turret lathe or screw machine.

Third—The single-spindle automatic turret lathe or automatic screw machine.

Fourth—The multiple-spindle automatic. Each of these types of machines is employed in the best modern practice. The respective fields in which they are most economically used may be rather clearly outlined.

The engine lathe is used for most special work in small quantities, for experimental work and tool making, and in general, for non-repetition work. In some cases it is profitably employed for quantity manufacturing, using special tool holders and other special apparatus.

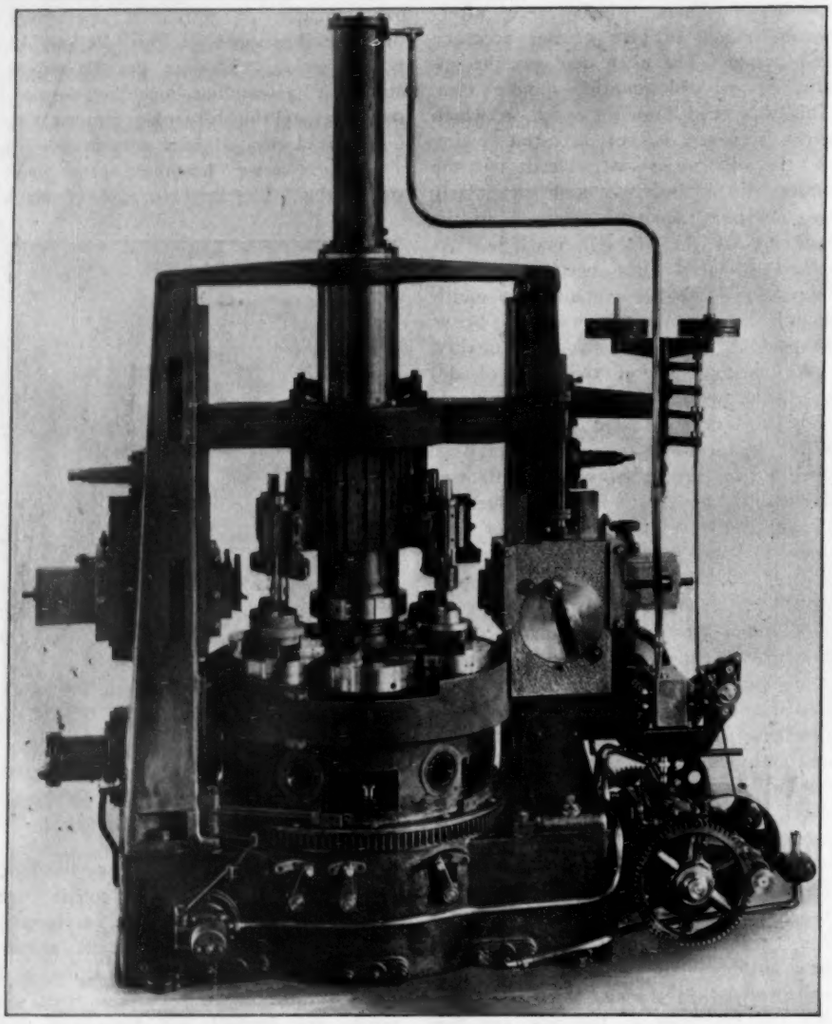


FIG. 18—CONRADSON VERTICAL MULTIPLE-SPINDLE AUTOMATIC WITH HYDRAULIC FEEDS AND CONTROL

Hand-operated turret lathes and screw machines are a step in advance of the engine lathe, as they provide means for a multiplicity of tools permanently set and operating against positive stops. They are thus able to duplicate complicated cutting operations on a series of pieces with great accuracy. The smaller sizes, or "screw machines", have found their field of operation on bar work greatly reduced by machines of the kind shown in Fig. 20. The tool illustrated is manufactured by the Cleveland Automatic Machine Co., Cleveland. These machines are particularly adapted to quick setting-up on small jobs, the hand screw machine on small bar work being handicapped by the greater proportion of idle movements and handling time to cutting time. Continuous activity without rest periods would be required to keep up with the automatic. But on work held in the chuck, particularly where turning operations are required, the automatic has not been developed to the point where it can compete on small work, and the small hand screw machine or turret lathe is consequently holding its own in this field. Its most serious competitor on work for which it is adapted is a machine of the type shown in Fig. 2.

In larger sizes of turret lathes the conditions are different. In the first place, the idle movements of the larger automatics can seldom be made any more rapidly than they can be made by hand, and the cuts are usually long enough so that the operator has periods of rest, even when pushing the machine to its limit. The strong point of the hand turret lathe is intensive production. Constant supervision and the opportunity for instantaneous changes of feeds and speeds make it possible to keep these up to the highest pitch, while the automatic must work at a slower rate as insurance against trouble. The hand machine also costs less, as a usual thing, and does not require so large an expense in special tooling. Thus the hand-operated machine offers not only a greater output per machine, but a greater output for the capital invested as well. This includes floor space and other property changes, as well as the charge against the machine itself.

Advantages of Automatic

The automatic, on the other hand, often offers a reduction in labor cost that more than offsets the increase in overhead charges which it incurs. Sometimes conditions of the labor market are such that the automatic is used even where the total cost of its product is known to be somewhat higher. It is undoubtedly true that there are many cases of hand turret lathes being used when automatics would be more economical, and there are certainly many cases when the reverse is true also. The merits of any particular case must be decided by the exercise of unusually good judgment; or, better, by a study of costs which takes the overhead charges into account as well as the labor cost.

In this connection it may likewise be noted that the manufacturing cost of high-grade machinery is usually made up of about one-third direct labor, one-third material, and the other third overhead charges of various kinds. Of these three items, that of material is not greatly affected by the style of machine used. In large work the hand machine tends to reduce the overhead charge, while the automatic machine tends to reduce the direct labor charge.

As previously stated, the multiple-spindle automatic screw machine is now firmly established, and capable designers are continually extending its field into more complicated and more accurate work.

The large multiple-spindle automatic, like those shown in Figs. 11 and 18, is still new, but the different machines of this type are being developed by skilled engineers, and the merits of the idea will have a thorough trial under the best possible conditions.

If there is demand enough for an article to support large establishments for its manufacture, and if there are no patent or other restrictions to keep

its manufacture in the hands of men of limited ability, the normal tendency is toward quantity manufacture in large establishments. The cheapening of production by using automatic machinery on large lots is an important factor in this tendency, although it is only one factor of several.

If the article of manufacture, such as an automobile, machine tool or agricultural machine, can be standardized, so that the design changes little from year to year, the advantages of large scale manufacture are still more apparent. Machines can be kept on one piece continuously day and night, if necessary, until worn out. Operators can be trained to great skill, not only in getting large outputs for the comparatively few pieces or operations in their repertoire, but in getting a high grade of workmanship as well, where that is necessary. Special machines, each built for one operation only on a single piece of work, can be profitably used. Such a machine is that shown in Fig. 17, which is designed for drilling automatically and simultaneously 84 holes in a particular design of automobile transmission case.

It is obvious that such a manufacturing system has its disadvantages. The most obvious of these are the necessity for keeping the product free from change as far as possible; and, also the monotonous character of the work from the operator's standpoint. In answer to the first objection, it is, of course, obvious that no industry is fit for this large-scale, intensive manufacture until the product is fairly well standardized; or at least until the particular design selected for manufacture is such that it will suit a large percentage of possible customers. To increase the field of customers, such an establishment is in a position to offer attractive low prices for its standardized output, in place of the frequent novelties and special features offered by the smaller manufacturers.

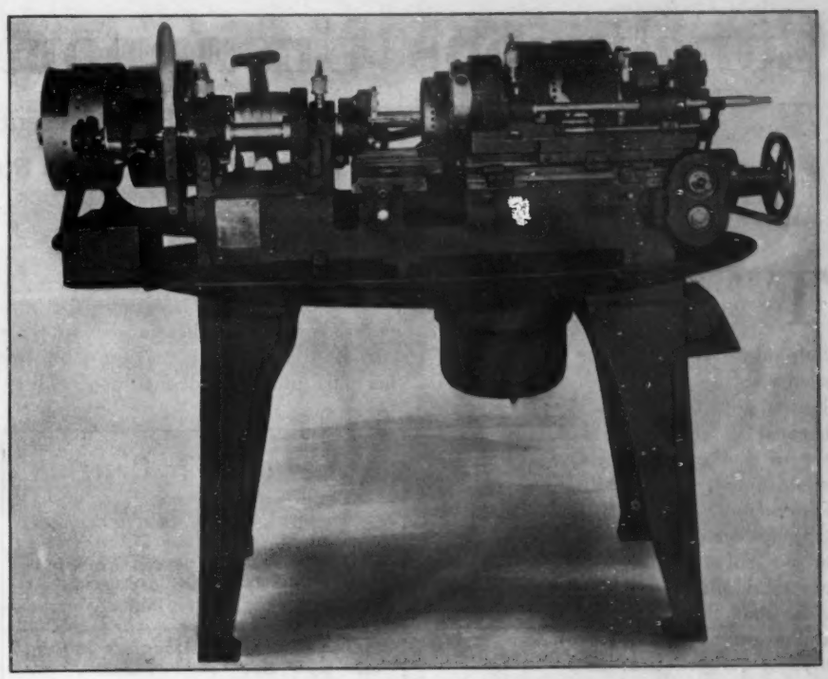


FIG. 20—CLEVELAND AUTOMATIC SCREW MACHINE

There is also something to be said for such an establishment from the standpoint of the workman. An immense amount of ability, of the highest order, must go into its management; and its organization furnishes opportunities for many such men. On the other hand, for workmen of faithfulness and dexterity but small originality, it can and ought to furnish work at higher wages than they could obtain in any other employment. Many skilled workmen, as well, find these high wages a compensation for the monotony of doing continuous work on one piece.

It must not be understood that all large-scale production is carried on in the ideal way just suggested, but there is a measurable movement toward these conditions, and there is at least one American automobile manufacturer who has become world-famous in working out the plan.

There is one factor in large-scale production which, curiously enough, tends away from automatic machinery of the costly, complicated type. In quantity manufacture one of the lines of study that gives largest rewards is that of adapting the design of the product to the methods of manufacture. It is usually possible to thus greatly reduce the cost without reducing the desirability of the product in any way. It is, furthermore, possible by this means to do the work on much simpler machines in many cases. And the result of such study is often to lessen the machining and divide the operations up into simple, quickly performed units. These may be done very rapidly by trained operators with special tools on ordinary machines. This tendency is especially noticeable in such highly organized industries as the building of textile and agricultural machinery, where the drill press and simplified forms of engine lathe are the most commonly used machines.

Industries large enough to be organized on the high production basis thus may be made practically free from the competition of smaller firms, if the

(*Continued on Page 920b.*)

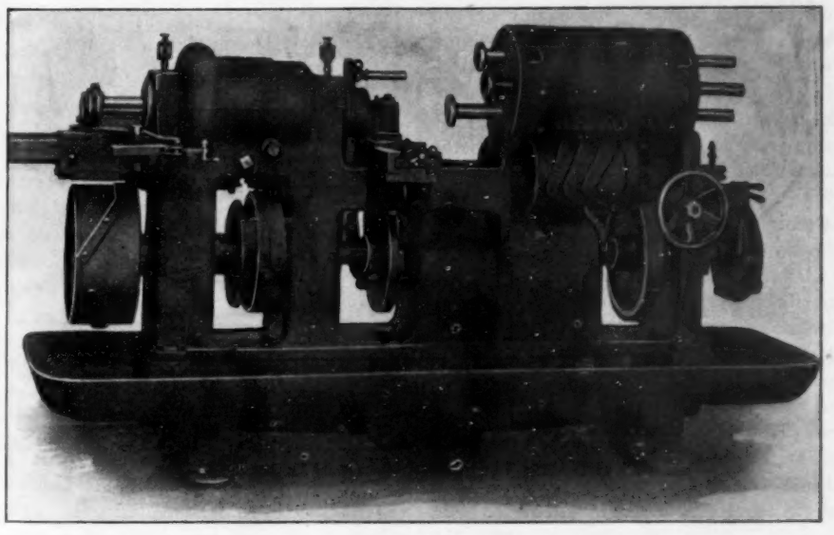


FIG. 19—MODERN VERSION OF SPENCER TYPE AUTOMATIC SCREW MACHINE BUILT BY HARTFORD MACHINE SCREW CO.

Conclusions Unsupported by Facts

American Metallographist Declares British Scientists Fail to Verify Statements in Regard to Sulphides in Steel Ingots

BY GEORGE F. COMSTOCK

THE publication of the paper by Prof. J. O. Arnold and G. R. Bolsover, entitled "How Sulphides May Exist in Steel Ingots" seems rather surprising in a practical journal like *The Iron Trade Review,* because of the purely academic interest of the matter presented, and the misleading nature of some of the statements. It is such articles as this that hinder the spread of confidence in the value of metallography among practical men, and give rise to the view that the microscope for the examination of metals is an interesting toy, of no practical use.

In the first place, one wonders what kind of crucible steel they make in England, if it contains four or five tenths of a per cent of sulphur. Perhaps the previous paper explains this high sulphur content as intentional, but at any rate the samples considered in this paper cannot be considered representative of average commercial steels, and the same conclusions cannot properly be drawn for both classes of material.

Evidence is Lacking

The first two tables of analyses, on cast No. 1499 and ingot No. 1461, look all right at first glance, but when carefully examined, no evidence can be found in them supporting the conclusion stated that "the aluminum has practically prevented any segregation". The segregation in cast No. 1499 is shown only for the *lump,* which is stated to have been very slowly cooled. This very slow cooling would, of course, induce segregation. No analysis is given for the *bottom* of the chilled ingot of this untreated steel, and the omission of this part of the evidence so necessary to support the stated conclusion looks rather suspicious. The analyses for the steel treated with aluminum were both taken from a chilled ingot, in which very little segregation could be expected. No slowly cooled lump was made in this case. Thus the difference in rate of cooling may have been the only factor influencing the segregation in these cases, and the statement that "the figures show that the effects were due merely to the aluminum" is not warranted by the facts.

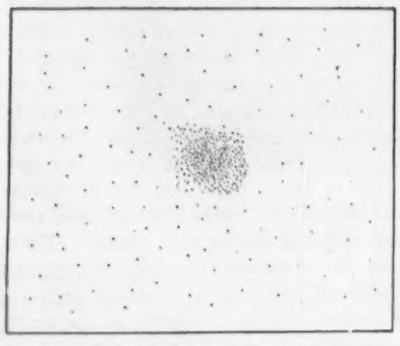


FIG. 1 — FINELY DIVIDED SULPHIDES IN SLIGHTLY MAGNIFIED STEEL SECTION SHOWING SEGREGATION

Under the heading "Additional Experiments", analyses of a large slowly-cooled lump of steel treated with aluminum are given, and these apparently support the stated conclusion of the authors that aluminum has prevented segregation. No evidence is offered, however, to show that this same steel would have exhibited segregation if aluminum had not been added. It is noteworthy that the silicon content of this heat No. 1540 is more than twice as great as that of the segregated heat No. 1499, and silicon decreases segregation by deoxidizing and quieting the freezing steel in the same way that aluminum does.

Abuse of Word "Segregation"

The photomicrographs illustrating this article are doubtless very fine examples of metallographic technique, but for the purpose of showing segregation, or lack of it, a photomicrograph taken with a magnification as high as 450 diameters, or even 200 diameters, is very nearly useless. The authors of this paper evidently use the word "segregation" to express two entirely different ideas, without distinguishing between them at all. To all practical steel men the term "segregation" implies the grouping or collection of impurities at a particular part of an ingot, or of a cross-section of a bar, where these impurities are present in larger amounts than in other parts of the ingot or cross-section. This is the sense in which this term is used by the authors when they discuss their chemical analyses. But in describing their photomicrographs, they use the same word, "segregation," to mean the existence of an impurity (in this case manganese sulphide) in comparatively large particles, instead of in a finely divided condition. This use of the term is something entirely new to practical men and leads to a con-

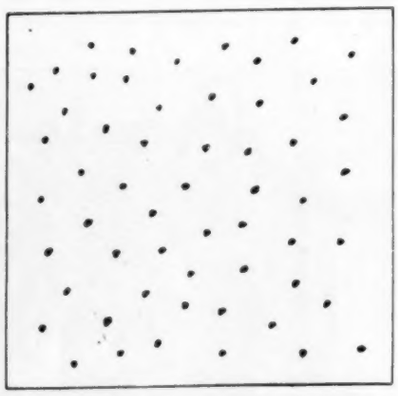


FIG. 2 — COARSE SULPHIDE INCLUSIONS IN STEEL SLIGHTLY MAGNIFIED, SHOWING LACK OF SEGREGATION

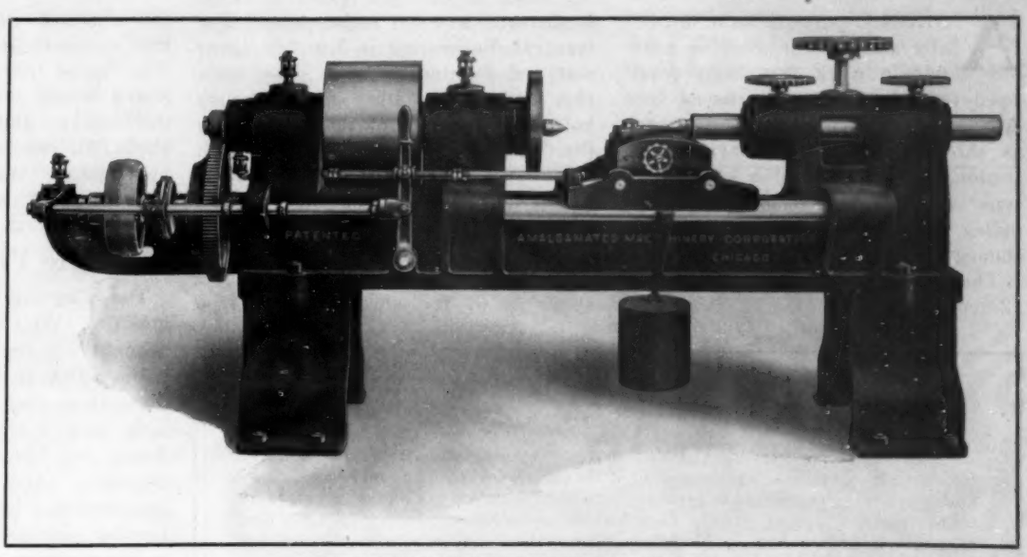
(*Continued on Page* 920b.)

A Sharp Challenge

Whether or not the British investigators whose conclusions were published in THE IRON TRADE REVIEW *of October* 14, *are guilty of the negligence and prejudice charged against them in this spirited article, the episode reveals the fact that in the iron and steel industry are cherished as high ideals of accuracy and integrity as anywhere in the world. George F. Comstock, the author of the criticism published herewith, is associated with the Titanium Alloy Mfg. Co., Niagara Falls, N. Y. While his review of Messrs. Arnold's and Bolsover's paper, which was read at a recent meeting of the British Iron and Steel Institute, is pungent and straightforward, it appears to be absolutely fair and honest and inspired by a desire for the maintenance of high standards in the metallographic science. For this reason* THE IRON TRADE REVIEW *reproduces this discussion in its entirety.*

Design Turning Machine for Rapid Work

A LINE of semi-automatic machines, including a turning machine, boring machine, drilling machine, geared drilling machine, and inside finishing machine, has been placed on the market by the Amalgamated Machinery Corporation, Chicago. These machines are designed for trimming, straight and form turning and boring, drilling, reaming, pocket forming, tapping and facing shrapnel and high explosive shells; and it is said that two or more tools may be operated by one man. The machines are furnished in 16-inch and 24-inch sizes, the accompanying illustration showing a 16-inch turning machine. It is claimed that these machines will take a cut at any speed and feed which the tool-holding devides and cutting tools will withstand. The forward carriage travel is by geared feed, the ratio of travel to spindle revolutions being, for the turning machine, 0.031-inch for finishing cuts and 0.047-inch for roughing cuts. For the boring machine, the ratio of travel to spindle revolutions is 0.026-inch for finishing cuts, and 0.037-inch for roughing cuts. Other ratios may be specified. A single lever controls both the feed and the quick return. Adjustable automatic limit stops for carriage travel in both directions have also been provided.

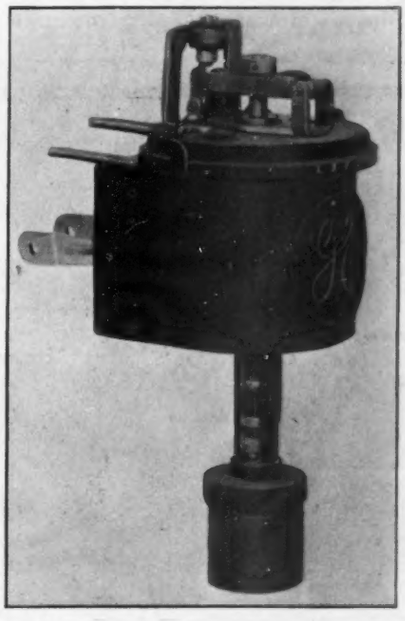


SEMI-AUTOMATIC TURNING MACHINE

A New Compensator Type Relay

A NEW circuit-opening inverse time limit oil dash-pot relay has been developed by the General Electric Co., Schenectady, N. Y., for use in conjunction with a low voltage release for automatic, overload and low-voltage protection of alternating current motors up to 2,500 volts and 300 amperes. The relay is connected in series with the line, the low voltage release operating across one phase in the usual manner with the low voltage coil in series with the relay contacts. On an overload greater than the current setting the relay, the relay contacts open-circuit the low voltage release coil and the motor is cut out of circuit. If the voltage drops to a predetermined per cent of normal, the motor is also disconnected from the power supply.

This relay is mostly employed with motors using self-contained compensator control, but sometimes for switchboard service when both low voltage and time delay overload protection are required. Here series relays replace the secondary relays, current transformers and oil switch tripping coils otherwise required. Current calibration is from normal to twice normal, and time adjustment from 10 seconds to five minutes on 25 per cent overload. The delay recommended, however, is about 15 seconds at the starting current of the motor. This affords ample protection to the motor against damage from overload or single-phase operation, but prevents the circuit from being opened while the motor is starting.



TIME LIMIT RELAY

A storage battery which it is claimed will deliver an unusual amount of electrical energy is being manufactured by the Nature Storage Battery Co., 451 People's Gas building, Chicago. Although no insulators are used between the plates of the battery, it is said that there is no danger of short-circuiting. The electrolyte used in the battery, it is said, contains no acid, and the plates are treated to prevent warping or deterioration.

A good plan to follow is to stamp all tools just before hardening, with the name or symbol of the steel used and the date. In this way, if the tool needs to be rehardened at some future time the treatment is indicated. The enduring qualities may also be deduced from the date.

Three Lathes Designed for Shell Work

A SINGLE purpose lathe, especially adapted for shell or automobile work, has been developed recently by the Cincinnati Iron & Steel Co., Cincinnati, O. The tool, as shown in the accompanying illustration, is of the simplex heavy duty type with geared head and single pulley drive. It is designed for machining 8, 9, 10 and 12-inch shells.

The standard length of the bed is 12 feet. The swing over V's is 26½ inches and over the bridge is 15 inches. Four speed changes are provided. The driving pulley is 23 x 7¼ inches. The gears in the headstock run in oil, the ratio of gearing being 26½ : 1 and 18 : 1. The main driving gears are 24½ inches in diameter, three pitch, 4½-inch face; and 22 inches in diameter, three pitch, 4½-inch face. The speed of the driving pulley is 400 revolutions per minute. The front spindle bearing is 8 inches in diameter and 9½ inches long. The rear spindle bearing is 5 inches diameter and 7½ inches long. The spindles are carbon steel with 2½-inch hole. The bearing of the carriage on the V's is 42 inches long, the width of the cross bridge being 15 inches. The extreme width of the carriage from front to back, is 41 inches. The carriage is equipped with heavy plain rest and four-post tool holder. The apron is of the shrouded box type with double support for each stud and gear. The gear reduction in the apron is 80 : 1. The tailstock spindle is 4¼ inches in diameter with a 9-inch travel. There are six feeds, the feeds per revolution being 1-32, 1-16, 3-32, ⅛, ¼ and ⅜ inch. The top of the bed from front to back, is 35 inches wide. The main driving pulley on the countershaft is 27 x 7½ inches. The two friction clutch pulleys are 18 inches in diameter and are designed for a 6-inch belt. The diameter of the countershaft is 1 15-16 inches. The speed of the countershaft for 8 and 9-inch shells is 425 revolutions per minute and for 10 and 12-inch shells, 362 revolutions per minute. The approximate shipping weight of the lathe is 12,000 pounds.

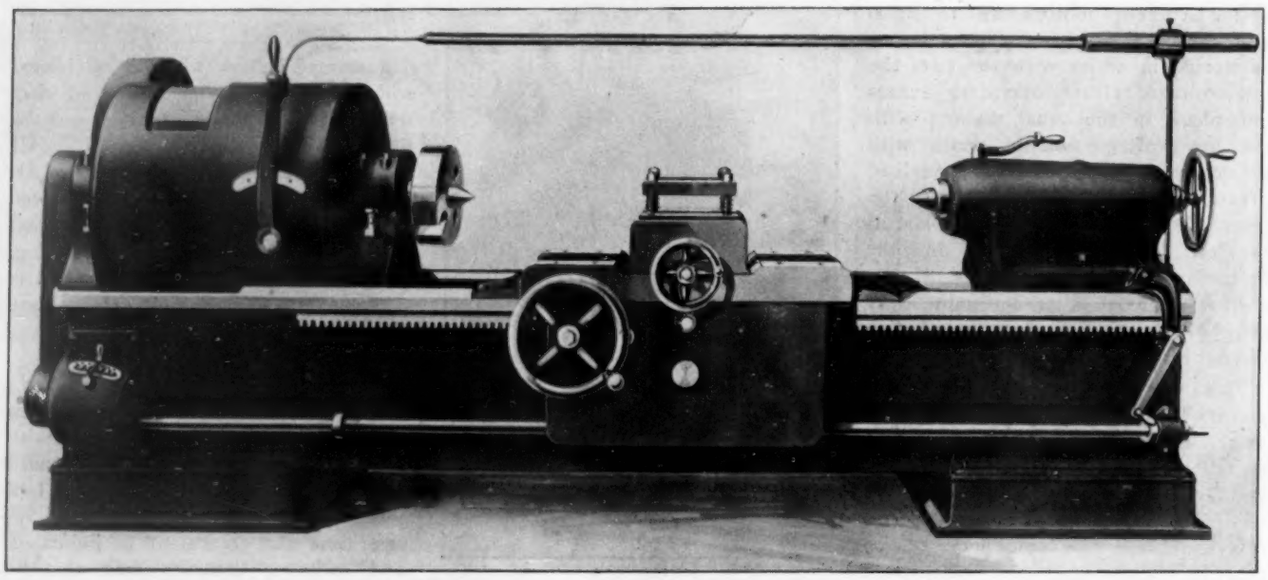
American Inventors Equal to Emergency

The American inventive genius, that remarkable alloy of inspiration and mental agility which has contributed so much to the advance of science and mechanics in the past century, was never called on more urgently or with more successful results than in the emergency of the present war. Huge shell orders had to be filled; new methods of mass production had to be devised; time was at a premium and labor scarce. In answer to the demands of shrapnel and high explosive shell manufacturers of this country for lathes that should enable them to fill their contracts, machines were devised, which were marvels of ingenuity and simplicity. The achievements of the mechanical engineer in this instance are not among the least which have been wrought in these days of big deeds. Three of these lathes are illustrated and described on this and the following page. They are representative of the many which have been brought forward recently by American manufacturers to meet a demand that seems as yet unsatisfied.

Single Purpose Lathe

The Cleveland Crane & Engineering Co., Wickliffe, O., has recently brought out the single purpose turret lathe which is shown in the smaller illustration on the opposite page. This tool is designed for machining 3-inch to 5-inch shrapnel and high explosive shell. It is claimed that the turning, drilling, boring and end forming operations may be performed in the minimum of time.

The machine is arranged for two speed changes only, and has an unusually simple feed mechanism. Three different equipments can be mounted on the bed. For turning, the lathe is equipped with a tail stock and carriage upon which a cross slide is mounted. This cross slide is arranged so that gangs of tools can be placed both in the front and back of the work, using each set of tools for separate operations. The tool block is slotted to suit the size shell which it is desired to turn. The lathe also is equipped with a turret mounted on a cross slide on a carriage giving 5½ inches cross movement. The third arrangement is a turret mounted integral with the carriage and is used for boring operations only, as in the case of a powder pocket and similar work. The lathe has a swing of 18 inches



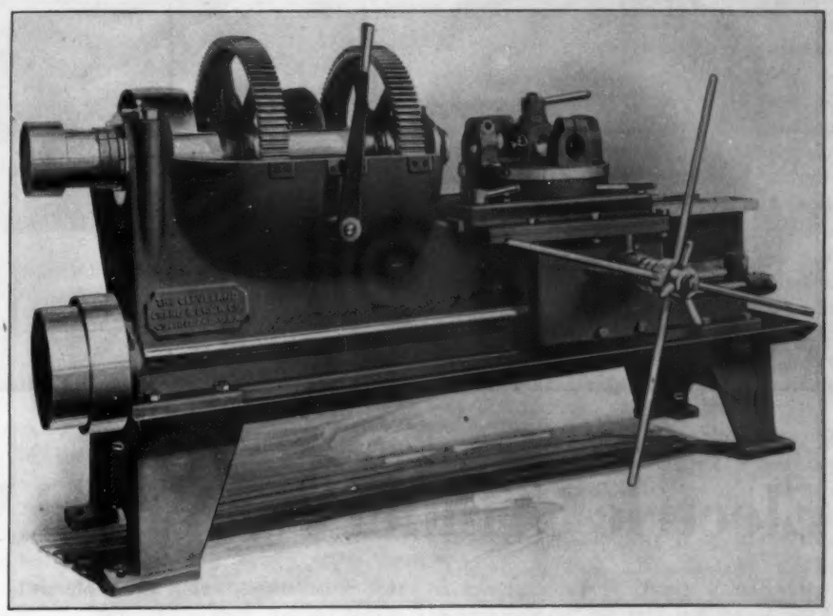
HEAVY DUTY GEARED HEAD SHELL LATHE MANUFACTURED BY THE CINCINNATI IRON & STEEL CO.

over the ways. The distance from the spindle nose to the face of the turret is 32½ inches with an 8-foot projected floor space. The longitudinal movement of the carriage is 28 inches. The head spindle is 38 inches over all in the bearings and has a 3¾-inch hole through its entire length. The front bearing is 5½ inches in diameter and 6 inches long. The rear bearing is 5 inches in diameter and 6 inches long. The turret is of the round, flat type, and is arranged for four bars. It is 20 inches in diameter and 19 inches across the tool clamps. These clamps are cast solid on the turret. There is a 3-inch hole in each clamp. The carriage is of the double-swing type and has a full bearing of 27 inches on the flat ways of the bed, which is 18 inches wide. The front bearing is 5 inches wide and 27 inches long. The rear bearing is 4 inches wide and 27 inches long. The speeds are secured by two friction changes in the head stock direct from pulley on the main line shaft. The feeds are secured by a 3-inch belt and a two-step cone. Two changes, 1/24 and 1/16, are obtainable. The driving pulley is mounted on the main shaft in the head stock, power being transmitted through two friction clutches with pinions meshing with two gears on the spindle. This arrangement gives spindle speeds of 73 and 105 revolutions per minute. Starting, stopping and speed changing are obtained through one lever within convenient reach of the operator. The driving pulley is 15 inches and is designed for a 6-inch belt.

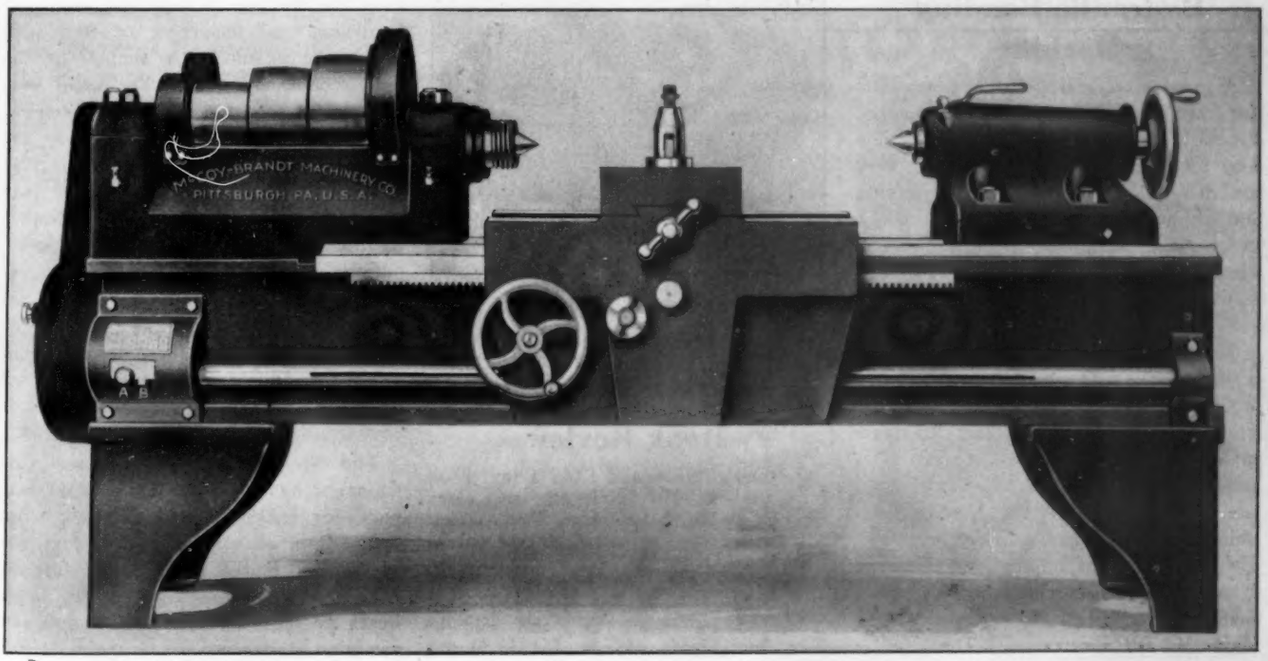
The weight of the lathe is 4,600 pounds. Its projected length is 8 feet and its projected width 4 feet 1 inch.

Lathe for Shrapnel

The larger illustration on this page shows a heavy duty engine lathe designed especially for heavy work, including the manufacture of shrapnel shells. At the present time, this machine is built in only one size, 18 inches by 8 feet, with a three-step cone driven by a 5-inch belt. The lathe has six changes of feed, three of which are secured by the pin at the head of the lathe in combination with two positions of the lever which are illustrated at *A* and *B*. The spindle is high carbon hammered steel. The bearings are of the split-box type and are equipped with oil ring lubrication with sight feed indicator. The carriage is of heavy construction and is provided with a large V-shaped groove to give a large surface for wear and to have power feed in all directions. The head and tailstocks have Morse taper centers. The standard equipment used with this lathe consists of a plain rest with a small face plate and one chuck plate, together with a single pulley friction countershaft. A six-tool turret can be attached to the carriage, if desired. The machine is being marketed by the McCoy-Brandt Machinery Co., Pittsburgh.



SINGLE PURPOSE TURRET LATHE FOR MACHINING SHELLS



LATHE FOR USE IN SHRAPNEL SHELL MANUFACTURE

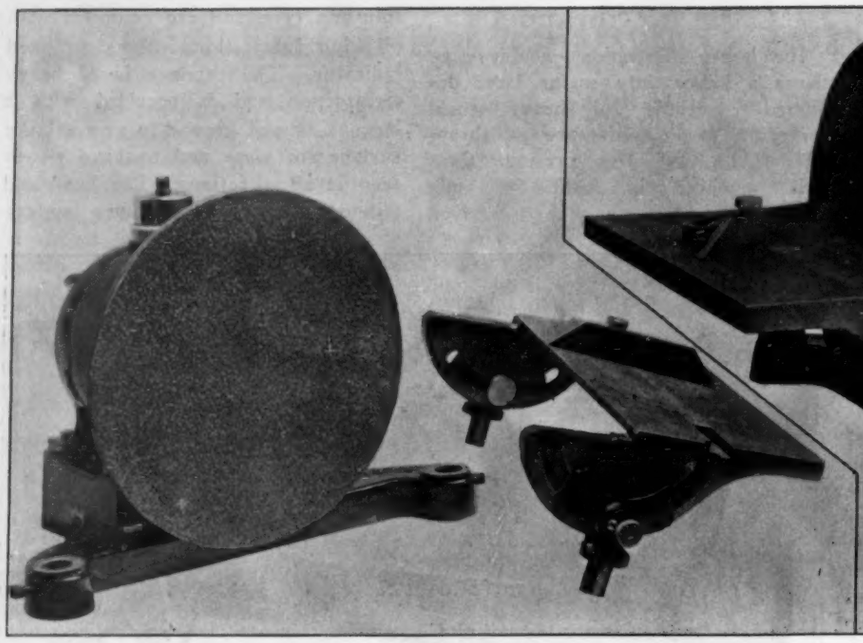


Fig. 1—Small Electric Grinder Unmounted

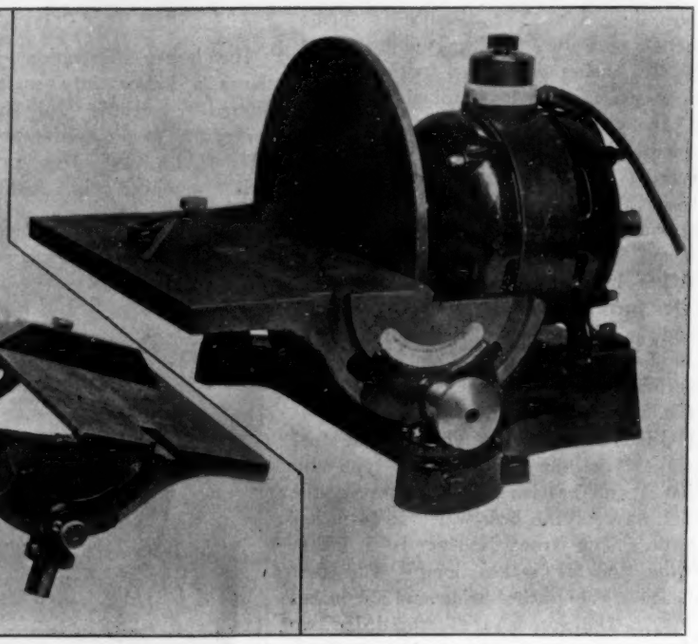


Fig. 2—Grinder Ready to Operate

Electric Grinder for Wood Working Shop

The small electric grinder shown in Figs. 1 and 2 is a recent development of the Standard Pattern Works, Erie, Pa. It is designed for use either in pattern and wood working shops, or in the machine shop or tool room.

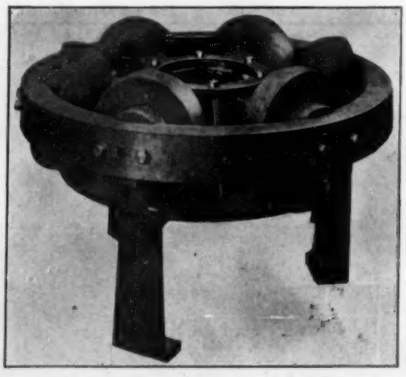
The square and angle guide shown in Fig. 2 can be moved freely to any desired position on the table. The knob and protractor, shown at the right in this illustration, permit the table to be placed in an inclined position at any angle between the horizontal and 45 degrees. An automatic stop is provided for the square, as shown in Fig. 1. These self-contained features are said to permit quick setting for any kind of straight jointing surface.

Fig. 1 illustrates the simple construction of the grinder. The table is released by turning two set screws, leaving the disc clear for applying a new sheet of abrasive.

The table of this machine can be removed without disturbing its accuracy. In the pattern shop these grinders are designed to be placed on individual benches in order to reduce lost time. It is said that any sheet abrasive may be used in conjunction with this tool.

Hydraulic Banding Machine

A new six-cylinder banding machine for rifling shells is being manufactured by the Southwark Foundry & Machine Co., Philadelphia. It is provided with six dies as shown in the accompanying illustration. The rifling band, which causes the shrapnel to rotate when ejected from the gun, is made of copper tubing, cut off in a hand screw machine or turret lathe. The rifling band is then dropped over the shell, a guide being employed to place it in its proper position. A slight pressure is exerted to fix the band permanently in a groove in the circumference of the shell. The shell and band are next placed in the banding machine, which is hydraulically operated. By means of two impressions the band is adjusted to the shrapnel, the rifling being accomplished by the six dies shown in the illustration. The shell is given a half turn after each impression.



Hydraulic Shell Banding Machine

Book Review

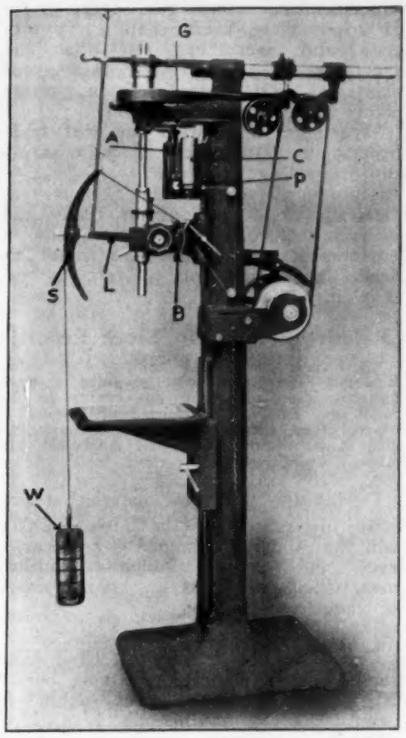
Forging of Iron and Steel a text book for students in colleges, secondary schools and in the shop, by William Allyn Richards, principal of the Grant Vocational High School, Cedar Rapids, Ia.; 219 pages; bound in cloth; 337 illustrations; published by D. Van-Nostrand Publishing Co., and sold by *The Iron Trade Review* for $1.50 net. The effort of the author has been to treat the forging of iron and steel and hardening and tempering of tool steel in a manner sufficiently simple for the high school boy and at the same time sufficiently thorough for the veteran smith. To give greater interest to the volume and better understanding a chapter has been introduced on the history of forging and another chapter on the manufacture of iron and steel, but the author has not thought it necessary to go deeply into the subject of metallurgy or metallurgical theory. The aim of the work has been to bring out principles and is the result of ten years' experience in manual training.

The Snyder Electric Furnace Co., Chicago, has installed an electric furnace for making steel castings from cold scrap, on an acid bottom, at the plant of S. Fair & Sons, Inc., Saginaw, Mich. It is stated that the first two heats averaged 620 kilowatt hours per ton and the third heat from a hot furnace, 580 kilowatt hours.

Tool for Hardness Tests

By Hugo Friedmann

A machine tool for making hardness tests has been developed by L. Loewe & Co., machine tool builders, Berlin, Germany, for use in their foundry. This tool, a small drilling machine, is shown in the accompanying illustration. The principle of the test is that a drill of



HARDNESS TESTING MACHINE

fixed size is driven a certain number of revolutions under constant pressure, as in the well known Jagger's method. The speed of the advance of the drill into the metal is registered automatically.

The constant pressure is applied by the weight *W* acting through a string upon section *S* of lever *L*. The registering device consists of the vertical drum *C* and the pencil *P*. The pencil is driven at constant speed by the small gear *G* and the screw *A*. The cylinder is turned slowly by a second string, which is fixed to section *B*, on the short end of lever *L*. Thus the rotation of the cylinder is proportional to the advance of the tool. If a piece of paper is attached at the cylinder, the pencil draws a line, which represents the combination of its own constant motion and the varying one of the tool. It is obvious that if the metal is harder, the angle between the registered line and the horizontal increases. Experience shows the slopes most advantageous for different work and a standard scale may be easily established.

The line drawn by the pencil is never exactly straight. At the start it is always steeper, owing to the greater hardness of the outer layers. Thus the method indicates the penetration of the chill.

Install Electric Furnace

The Simonds Mfg. Co., Fitchburg, Mass., has signed contracts with the United States Steel Corporation for license and with the American Bridge Co. for the installation of a five to six gross ton Heroult three-phase electric melting furnace.

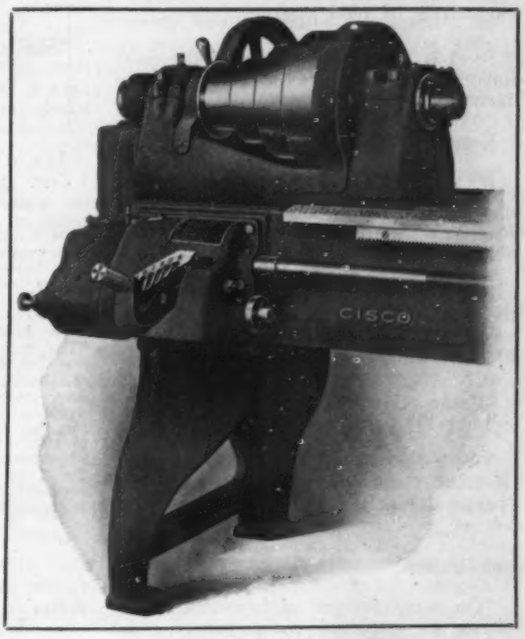
It may be a matter of interest to know that the Simonds Mfg. Co. procured the first Girod license in the United States and a small 500 kilogram furnace was installed at its Chicago works for experimental purposes. When the steel mill of the Simonds Mfg. Co. was moved from Chicago to Lockport, N. Y., in 1910, this furnace was moved as part of the regular equipment. In 1914 this small furnace was dismantled and a larger one was designed and built by the engineers of the Simonds Mfg. Co., following very closely the original Siemens type, with one electrode in the hearth and one electrode through the roof. The results obtained from these two furnaces, covering a period of nearly five years, have indicated that a larger furnace of the type now building would be desirable.

The furnace and its auxiliaries were designed by the Societe Electro-Metallurgique Francaise and the United States Steel Corporation. Construction work on the buildings, auxiliary equipment, and the furnace itself is well underway and it is hoped to have the furnace under power by January 1.

Metric Gear Box

The metric gear box used on lathes manufactured by the Cincinnati Iron & Steel Co. is shown in Fig. 2. This company's metric lathes cut the following pitches: 12, 11, 10, 9, 8, 7, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.75, 2.5, 2.25, 2, 1.75, 1.5, 1.375, 1.25, 1.125, 1 and 0.875.

These pitches are obtained through the quick change gear box, illustrated. All changes are made without changing any of the gears. The reverse, instead of being located in the end of the headstock, is incorporated within the gear box. By this arrangement, it is within easy reach of the operator. As it is located at the head of the lead screw, the change gears run only in one direction.



GEAR BOX FOR LATHES

Bulb Sections

The Carnegie Steel Co., Pittsburgh, has issued a pamphlet describing its line of bulb sections. The booklet contains tables and data on all the profiles now being rolled by the Carnegie company. It was issued in recognition of the increasing use of these sections.

Some years ago, bulb angles and bulb beams were used extensively in ship building. At that time steel manufacturers in this country rolled a limited line of both sections. Later steel channels were utilized in place of bulb sections in ship construction and for many years the tonnage of the latter sections rolled was extremely limited. Recently, however, the bulb angle and bulb beam type of construction has again gained in favor. In addition, the bulb angle section has now come into use for strengthening the tops of all-steel gondola freight cars. A number of sizes particularly designed for this purpose have come into use.

The revival of ship building in the ship yards of the United States and other neutral countries, brought about as a result of the European war, has led to the construction of a number of vessels according to recognized English standards. In these, the bulb angle is utilized in the framing of the floors.

The Carnegie Steel Co. announces that it now rolls for the first time in the United States, a fairly complete line of bulb angles to standards adopted by the British Standards Committee.

The Williams Tool Co., Erie, Pa., manufacturer of pipe threading and cutting machinery, has been awarded a gold medal for its exhibit at the Panama-Pacific exposition.

Sparks from the Grinding Wheel

By H. O. Tair

"DEAR editor, you'll find enclosed
Description of our new machine,
Which please us, if you're so
disposed,
By running in your magazine."

And this is how the item went:
"Machine trade revolutionized
By Smith-Jones-Thompson, who invent
A thingumbob now recognized

"As better than the very best
The world has ever known before—
So far ahead of all the rest,
It has no real competitor!

"Beware of any other kind,
Sold by the imitating mob;
No other builder e'er designed
One-half so fine a thingumbob!

"So when you buy a thingumbob,
Be sure to buy a bustless, rustless,
Non-erratic thingumbob—
A crustless, dustless,
Full automatic, Smith-Jones-Thompson
thingumbob!"

But this is how the item read,
When printed in the magazine:
"Friends Smith-Jones-Thompson—it is
said—
Have perfected a new machine—

"A thingumbob, alleged to be
Of novel style and neat design,
And those who've used it all agree
'Tis very useful—in its line."

And Smith-Jones-Thompson, mad as
mad,
Wrote in next week—
"Please Kill Our Ad.!"

* * *

Munition manufacturers of humane tendencies are making their shrapnel exclusively of mild steel.

* * *

Steel is getting to be one of the most important by-products of benzol manufacture.

* * *

King £ is dead. Long live King $!

* * *

France and England are buying large quantities of portable houses, while Russia is figuring on a lot of deportable ones.

* * *

Future mineralogists will ponder over the strange ferric oxide deposits stretching in narrow parallels across Europe south of the Rhine.

* * *

"Uncle Sammy's Selling Shells to Soldiers!"

* * *

Timekeepers should brighten the lives of those about them, says an article on "personal touch." Timekeepers we have known used to introduce a recalcitrant employe to a whole stellar galaxy at one wallop.

* * *

"On some designs of bayonets," complains an esteemed contemporary, "the length of the blood groove is given in thousandths of an inch and the distance from its end to the end of the blade is also specified in thousandths. Who was the man who averaged the size of a soldier so carefully that he could design a blood groove to thousandths of an inch? Another bayonet detail calls for a profiling operation on the hilt to produce grooves into which tongues cut on the wooden grips are made to fit. What prevents us from riveting on the wooden grips of butcher knives for men, in the same way that we rivet on the wooden handles of butcher knives for pigs and steers? It is a much easier mechanical operation to perform."

This indeed is an annoying problem, but our contemporary should be more patient, remembering always that such difficulties are part of the White Man's Burden, cheerfully to be shouldered in the great cause of Christian civilization.

* * *

They are trying to sell battery mud in the Chicago old metal market. An interesting item for German artillerists mired in Polish swamps.

* * *

"Employers," says *The Daily Iron Trade*, "can trace back a considerable percentage of their troubles to the machinations of a machinists' union." Still, one can scarcely blame a machinist for following his naturally machinatory instincts.

* * *

Germany's last reserves, it is said, are to be called to the colors. The legions of tin and lead soldiers which annually sallied forth from Nuremberg in times of peace, must now enter the furnace to provide metal for munitions.

* * *

"Shells are cheap. Their manufacture is second nature to Canadians," says a Dominion trade paper. A mighty handy instinct just at present.

* * *

It's All In One's Point of View

"The whole international striking power of the British Empire has been created by the spirit of commercial adventure, and it is most ungrateful for any citizen to turn round in a period of crisis brought about through the failure of electioneering experts, and charge industrial directors and managers with unpatriotic greed." So says the British *Engineering Review* in a recent editorial. A little further on the *Review* declares that "The practical objective of the Allies is to see that German industry is not again made the basis of ambitions for world power and domination. Germans will, after the war, work harder and live more frugally, and it is for the Allies in conference and individually to take care that, while the world may have some benefit from the production of wealth in the Central Empires, both the military and commercial supremacy of the Allies shall be maintained."

* * *

". . . And on top of this is the private profit amounting to between 20 and 60 per cent on every dollar's worth of munitions and supplies for the army and navy that is paid out to greedy contractors and trusts. Congress must face the question of building every naval vessel, manufacturing every gun, every piece of armor plate, every shell, every torpedo and everything else that the army and navy requires in government plants at cost instead of in private plants at an enormous profit.

"We must not fatten the war traffickers in getting an adequate army and navy!"

Thus speaks one of the Scripps syndicate papers. If Congress really had to manufacture all those munitions in government plants *at cost* it would indeed "face a question," a terrible one, at that.

* * *

Futurist Poem? No, Stock Report!

"Bethlehem as usual taking the palm. Woolen's latest war order provided a thrill for that issue and there was energy in Alcohol and Distillers. Strength of Inspiration when other coppers were undemonstrative gives point to the story that Anaconda will take it over."

* * *

During the next few months, steamboat inspectors on the Great Lakes will be simply swamped by earnest-eyed and entirely guileless nautical men asking for light on knotty points of the Seamen's law.

* * *

Our dear old friend, the Civil War shell which explodes after lying buried 50 years, has bobbed up again in print. This time it has been kind enough to merely wreck a foundry cupola, instead of slaying the customary veteran revisiting the field of glory.

* * *

Vice Chancellor Backes of New Jersey ruled that the machinery and other equipment of a bankrupt steel plant was real estate. So it was sold dirt cheap.

* * *

Sherman must be revised again. Not hell, Bill, shell!

* * *

The market reports alleges light consumptive buying of scrap. What do consumptives want with scrap, anyhow?

* * *

That "common language" clause of the Seamen's act will at least make a hit with the Esperanto enthusiasts.

* * *

A daily contemporay says that "a highly spoken of" attorney has been named secretary of the federal trade commission. No doubt it was a position that he deserved the appointment to.

* * *

A Song for Swiss Bell Ringing Accompaniment

Oh, where, and where has my little
dove gone?
Oh, where, and where can he be?
With his beak grown sharp and his
claws grown long—
Oh, this can never be he!

Evolution of the Electric Furnace

Electric Steel a Direct Answer to the Imperative Demand for Higher Quality—Is Only on the Threshold of Development

BY DR. KARL GEORGE FRANK

THE beginning of the twentieth century saw the advent of the electric furnace, its introduction into the iron and steel industry, and its use on a comparatively large scale. It received no hearty welcome, but developed steadily until today it has become valuable, with an increasing range of usefulness. Those who look ahead see a vastly larger field, and firmly believe that eventually the electric furnace will be generally employed in all branches of the steel industry and that by it steel will be produced possessing characteristics far superior to anything we produce at present.

The simple fact that the electric furnace has been successfully introduced and has demonstrated its usefulness and applicability is sufficient proof that its appearance is not accidental, but that it arrived at a time when the existing means for the production of iron and steel were insufficient to meet new conditions.

Every person knows how closely the technical and commercial conditions are related in any industry, but it may not occur to him that a step in advance in the steel industry may be due to certain changes in social or even political conditions, and that vice versa, an improvement in the steel industry may react on such conditions and possibly influence the national welfare.

Interralates With Larger World

An industry and its technical appliances do not constitute a world by themselves, but are a part of a larger body whose purpose they must serve. The engineer who lays out the plans of a power station or an electric railway, or the telephone engineer who plans for the enlargement of a telephone exchange, must very carefully investigate general conditions in the community. He must take into account the human element, and the tendencies in private as well as in business life, as all these factors will influence such an undertaking.

I touch upon these points here because I want to show that external influences, as well as the development in the iron and steel industry brought about the advent of the electric furnace. We have only to look back into the history of the iron and steel industry of the United States in order to realize that my general statements can easily be verified.

The iron and steel industry of the United States was of little importance before the civil war, especially as compared with England's highly developed works, and it did not begin to extend and develop on a larger scale until 1868 to 1870.

During the entire period from the civil war up to 1900, the means at the disposal of the steel industry were fully sufficient to produce all the material required by the country. The blast furnace, the converter, the open hearth furnace, and especially the crucible, enabled steelmakers to meet the demand for practically all kinds of steel used. From that time on, however, a new development set in, which is characterized by the fact that it is intensive rather than extensive, in contradistinction to the preceding period. New industries sprang up, creating a demand for steel of high quality. Competition increased, and it became evident that further improvement in the manufacture and production of iron and steel was needed.

Condition Propitious for New Furnace

If we add to this, the fact that no new iron mines of any importance were discovered in this country, that high grade ore has to be imported today from Cuba, Chile, etc., and that ore of lesser quality has to be used, we will easily understand that a new furnace which promised to overcome some of the difficulties of the day was gladly accepted. Not only ore, but other raw material, cold scrap, etc., underwent a change for the worse, so that steelmakers had to use poorer material, or pay higher prices than previously.

Additions to the mileage of the railroads during the period under discussion were, of course, much less than in former eras, but the heavy traffic in the great cities and the vastly increased freight movement created a demand for heavier and better rails. On the other hand, endeavors are now being made to design lighter cars for passenger as well as for freight service, without, of course, decreasing the mechanical strength, so that steel of better quality and with better mechanical properties must be used. The total weight of locomotive drivers increased from about 69,000 pounds in 1885 to over 180,000 pounds in 1907, and in that year reached a maximum of 316,000 pounds. The average axle load increased during the same time from 22,000 pounds to 48,000 pounds, and the weight of rail per yard from 65 or 75 pounds to 85 or 100 pounds. When the American Society of Civil Engineers adopted their standard section in 1893, 80-pound rails were just coming into use.

The electrical industry, which grew to unexpected and unprecedented greatness, called upon the steel industry for better or more suitable raw material. Transformer and dynamo sheets of low carbon content but high in silicon for reducing hysteresis losses were needed. The casings of railroad and mill motors demanded a

A Striking Parallel

We are all familiar with the adage, "the times produce the man," which seems to be amply supported by history. That this theory has a parallel in the chronicles of industrial development is, however, a new idea to many. In this article, Dr. Karl George Frank, American representative of Siemens & Halske and the Siemens Schuckert-werke, Germany, has made a convincing argument to support his conclusion that whenever a great industry reaches a stage at which new methods and new inventions are necessary for further progress in a normal line, such developments are inevitably forthcoming. The genius of man, he contends, has ever been equal to the demand automatically placed upon it by the growth of the work of man's hands. Dr. Frank foresees a high future for the electric furnace, which is today engrossing the attention of brilliant engineering minds throughout the world—or that part of the world which is still able to think constructively. His surmises of the future duplex process for the production of fine steel are not merely interesting, but convincing.

A paper read at the ninth annual convention, Association of Iron and Steel Electrical Engineers, Detroit, Sept. 8 to 11, 1915.

low carbon steel of good magnetic properties; through the increasing speed of turbo-generators new requirements were set up for a steel of good magnetic properties and at the same time possessing extremely high mechanical strength.

The small electric motor has also received new attention and its further improvement and development is probably largely dependent upon the material for its active parts. Steam turbines, high velocity rotary pumps, and similar machinery, add further to the demand for high grade steel.

The automobile industry has been of special importance and great influence with its manifold requirements, from the highest grade of alloy steel for axles, gears, cam-shafts, and magnetos, down to ordinary steel castings.

The hardware industry with its varied products, including pipe fittings, fixtures and household goods of all descriptions, must also be mentioned. So we find a great number of industries, each one offering its particular problem and its special requirement as to proper material, and all of them ready, even waiting, for improvement in the raw material, and their progress largely dependent thereupon. Steel pipes for the high pressure water systems of municipalities, tubes of all descriptions, valves and fittings for city water supply, nuts, bolts and rivets of higher mechanical strength, and a great many other implements, should also be mentioned.

Methods Improve

The methods of manufacture have likewise changed and improved in order to meet new conditions. Lathe work, planing and milling, has found an important auxiliary in grinding, thus enabling the use of hardened gears, shafts and valves. It is well known, however, that even this method does not always overcome the existing difficulties. Internal strains are set up, which frequently change the shape of such hardened parts after grinding, which sometimes even a finishing grinding cannot fully remove.

This phenomenon shows us that the behavior of steel under certain conditions is still little understood, and that a good deal remains to be done. The problem involved can only be solved by careful and thorough scientific investigation, carried out largely by the chemist and metallurgist. It is evident to everybody familiar with the conditions of the steel industry that the electric furnace will prove to be a very valuable aid in solving all these and many more problems. Its flexibility and adaptability will increase with scientific knowledge. In drawing this conclusion I do not limit it to cases where the production of electric steel will prove to be more economical, as for instance crucible steel, but I include also those branches of the industry in which the economical superiority of the electric furnace is still very doubtful.

Price Not an Essential

The question involved is by no means one of price only, and at any rate, not of the price of steel as raw material. In quite a number of instances in which the cost of labor is to be taken into consideration, it can be shown that the use of the higher grade of steel as raw material cheapens the product instead of increasing its price. This is so in all cases where loss from faulty material is greatly reduced by the use of higher grade raw material, and in each particular case it will be possible to find the limit and conditions under which high grade expensive raw material will permit the most economical production.

Aside from this, there is no need for striving to compete on the basis of mere price, which I consider fundamentally wrong. What we must strive for is the production of a higher quality of steel, which shall command a higher price, and which, in spite of such higher price, is more economical in the long run than other steel. It is mainly for this reason that I am convinced the electric furnace has come to stay, because it seems the best, and in not a few cases the only means, for producing steel of the utmost quality. That does not mean, of course, that in years to come all low grade steel will disappear, but it means that in each of the branches of the industry, steel will be made, which will exhibit some superiority as compared with that formerly used in that particular branch. Furthermore, the above statement does not mean that the electric furnace will replace all other furnaces hitherto used, but it means that it will become an adjunct to all other furnaces for refining and improving their product. It follows, therefore, that the electric furnace is essentially a refining furnace, which was never intended to compete with the blast furnace, or the open heart furnace or the cupola. It is true that in some instances electric furnaces are successfully employed for melting or smelting, but these cases are not representative. When the electric furnace is used for melting and refining, and competes successfully with the combustion type furnace, it is because the advantage derived from the refining exceeds the loss which usually results from using the electric energy for melting only. The economic problems involved must, of course, be considered individually.

I have no doubt that a duplex process will sometime offer special advantages, so that the melting proper may be carried on in a cupola or open hearth furnace, or liquid bessemer steel may be used, while the action of the electric furnace will be confined to the refining only.

Naturally, the question arises as to the specific technical or physical element by virtue of which the electric furnace can accomplish all these results claimed. The answer to that question may be simply stated. The electric furnace produces a temperature higher than any other furnace. It produces this higher temperature without contamination of the charge through gases and other impurities, etc., and in the case of the induction furnace, without contamination through carbon. The electric furnace, and especially the induction furnace, makes it possible to control the temperature within limits which are entirely beyond the reach of the old furnaces. There may arise some doubt whether the temperature is really such an important factor, but to substantiate that contention it should be sufficient to call attention to the behavior of silicon and carbon in the bessemer converter, or of phosphorus, sulphur, manganese, etc., in the open hearth furnace, facts which are well known, and represent conspicuous cases. There are really only three fundamental factors which determine all steel producing processes; the chemical composition of the material, the temperature and the time. The more perfectly we control these elements during the process, the more perfect results will we obtain.

Steel Manufacturers Should Investigate

Thus we see at once the immense possibilities of the electric furnace, and it only remains for the steelmaker to thoroughly and carefully investigate his opportunities. He must, of course, not stop at the ladle, but must go on into the foundry, rolling mill, forge, hardening furnace and even the machine shop, in order to be fully informed as to the behavior of the steel during its conversion.

In these branches of the steel industry, electricity has already rendered great service, and has helped to solve the problems involved. It will do more in the future, and I can well imagine that the temperature of steel in foundry molds, or while passing through rolling mills, will be controlled by

electricity, in order to influence the cooling process, which, as we know, is quite important in determining the character of the finished product.

We have, therefore, good grounds to trust that the close co-operation of the electrical engineer and the steel maker will result in improvement and progress in the steel industry, and the electrical engineer will always welcome the opportunity to assist in solving the problems of our iron and steel industries.

Bailey, Private Secretary

"Do you think steel common will go to 100?"

"How will I make out this note?"

"Do you know the book value of Union Trust Co. stock?"

"What percentage of the entire steel output of United States is manufactured in the Pittsburgh district?"

"What is the duty on steel rails?"

"Is Andrew Carnegie a Mason?"

"What was Bethlehem quoted at this morning?"

"What time is the next train to New York?"

"Under the last ruling of the interstate commerce commission, is the Bessemer & Lake Erie railroad a plant facility?"

"Where was the battleship NORTH DAKOTA built?"

"What is Mr. So and So's salary?"

"To what analysis do you make your armor plate steel?"

"Who is vice president of the Missouri Pacific?"

Some of the foregoing questions may sound simple, but to have them and scores of others propounded every half hour or so would drive most men to distraction, especially if intelligent answers had to be supplied immediately.

And yet, the secretary to the president of large concerns—the Carnegie Steel Co., for instance—has to answer questions equally as perplexing as these every working-day of the year. Hundreds of men and women call on or telephone him every month for information about steel products, stocks, bonds, jobs, the President of the United States, and boss roller at the mill, etc. The secretary to the president of a concern of the importance of the Carnegie company must be a natural born diplomat, and a pastmaster in the art of importing and retaining information. He must serve all; he cannot disappoint or offend anybody. He is kept on the jump all day long, and it is not unusual for him to be called out of bed in the middle of the night to take care of the morning newspapers. Secretaries to most big men have to know something about everything.

William M. Bailey, secretary to Alva C. Dinkey, president of the Midvale Steel & Ordnance Co., became a combination encyclopedia and ready-reference book while serving his chief with the Carnegie company, from which he recently resigned. Mr. Bailey, who is "Bill" to his hundreds of friends, knows something about everybody and everything connected with the United States Steel Corporation. He learned a lot about all kinds of things after becoming Mr. Dinkey's secretary nine years ago. What Bill doesn't know about things in general and things not in general, isn't worth bothering about at all.

Mr. Bailey began his career with the Carnegie company as a messenger boy, July 6, 1900, in the office of

WILLIAM M. BAILEY

Homer J. Lindsay, assistant to the president of the company under Charles M. Schwab and William Ellis Corey. In 1907, Mr. Bailey was taken to the office of President Dinkey. Since that time, he has become personally acquainted with practically every steel company official of prominence in this country, and has met and entertained scores of engineers and steel manufacturers from foreign lands. His intimate knowledge of political, financial and business conditions has been of no little assistance to friends and associates in the Carnegie company.

H. G. Saylor, secretary to Homer D. Williams, the new president of the Carnegie company, rapidly will become a cross-indexed lightning-fire source of information. Mr. Saylor's early training in the business and commercial world will be of value to him in his present work. For a number of years, he was a private telegraph operator in the office of Col. Thomas E. Watt, passenger agent for the western district of the Pennsylvania railroad. In 1902, he accepted a stenographic position at the Duquesne works of the Carnegie company. In August of the following year, he was appointed private secretary to Mr. Williams, who took charge of the Duquesne plant at that time.

Big War Contracts

The Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., now has war contracts aggregating $30,000,000, which means that the enlarged plant will be run to full capacity all of the year 1916, at least. In addition to the rapid fire guns which the factory is making, the company has a large order for automatic pistols from the Greek government. The new machinery for the manufacture of the new Vickers gun is ready to be installed and the entire west armory is expected to be in operation by Jan. 1. The output of the plant will then be more than doubled, reaching 1,000 machine guns a month. When it is remembered that only 100 a year were made before the European war broke out, an idea can be gained of the expansion now going on.

Swedish Iron and Steel Production

According to official statistics of the Swedish iron trade for 1914, the production of iron ore in Sweden during that year was 5,966,039 tons of ore.

Pig iron production for 1914, as compared with 1913, was as follows:

Forge, 152,859 tons as against 186,090 tons; bessemer, 111,830 tons as against 141,641 tons; basic, 335,216 tons as against 358,437 tons; spiegeleisen, etc., 5 tons as against 50 tons; foundry, 12,820 tons as against 14,250 tons; other qualities, 14,655 tons as against 15,891 tons; blast furnace castings, 12,333 tons as against 13,898 tons; total, 639 718 tons as against 730,257 tons.

During 1914 there were 74 works producing puddled iron and ingot steel and castings as against 77 in 1913.

Of the total of 507,332 tons of steel (ingots and castings) produced in the year under review, 300,104 tons were basic as against 353,696 tons in a total of 590,887 tons during 1913.

Business News of Nation's Capital

Appeal Filed in Steel Corporation Case—President Considering Various Plans for Prevention of Dumping by Present Belligerents

Washington, Nov. 2.—Work of reducing the 50 odd volumes of testimony given at the hearings in connection with the government's suit to dissolve the United States Steel Corporation is being pushed by the department of justice. This is a tremendous task of condensation, the greatest of the kind that has ever come before the department, and is necessary by reason of the rules of the supreme court, with which the brief will be filed before the arguments are made on the appeal. Petition for appeal, filed last Thursday afternoon in the district court of the United States at Trenton, N. J., was a formal proceeding, which was to be taken as a matter of course, and is in line with the announcement made by Attorney General Thomas W. Gregory, when the lower court dismissed the suit against the Corporation.

It may be that the brief will be ready for filing with the supreme court soon after the new year, and arguments be held in the spring, or sooner, but it seems that a decision by the supreme court can be rendered before a year. The petition for appeal was filed by G. Carroll Todd, assistant to the attorney general, and Henry E. Colton, special assistant to the attorney general, but the arguments for the government may be made before by the supreme court by Attorney General Gregory.

The petition was accompanied by a statement carrying 23 assignments of alleged errors made by the lower court, which held the Corporation was not a trust in violation of the Sherman act. The alleged errors carried in the bill of exceptions are based on the charge that the lower court was wrong in failing to find the Corporation is a combination in restraint of trade and in not ordering dissolution of it and its subsidiaries.

The government in its assignment of errors, respects numerous charges made in the original petition.

Favors Present Rate

Washington, Nov. 2. — The Vulcan Iron Works Co. has filed a brief with the interstate commerce commission asking that it deny the petition of railroads and the R. Hardesty Mfg. Co., seeking the re-establishment of a rate of 45 cents per 100 pounds on iron and steel articles from Mississippi river crossings to Denver. The Vulcan Iron Works Co., upholding the present rate of 60 cents, says the 45-cent rate is far too low and is out of harmony with the adjustment to points in all territory east of Colorado common points.

President Listening

Washington, Nov. 2.—No surprise was occasioned by the direct statement made last week by Joseph P. Tumulty, secretary to President Wilson, that the president has not accepted anybody's plans for avoidance of the possible dumping of foreign goods into the United States market at prices ruinous to business and labor after the European war. The statement followed publications that the president "favorably received" suggestions from Secretary of Commerce William C. Redfield, and the federal trade commission that dumping should be made impossible by the enactment of a law making it unlawful for foreign manufacturers to sell their products in the United States at less than the cost of production in the countries where the products were made. It has been pointed out heretofore that the president resents the promiscuous practice of placing him in the position of approving this or that plan in the absence of an expression coming directly from or authorized by him. He has often, it is asserted, emphasized the truth of his statement that he has a tongue of his own.

It is known that the plan to avoid dumping has been contemplated, but the question as to whether it was approved by the president had not been discussed until last week after Secretary Redfield and Chairman Joseph C. Davies of the federal trade commission had held a conference with the president.

Secretary Tumulty said that the president has not reached any conclusion on the matter of preventing dumping, but has asked for reports and information and that his mind is entirely open. To all plans suggested to him, it was stated, to meet the economic conditions after the war, he is merely listening. It is asserted that the president will advocate legisaltion of some character at the coming session of congress which will effectively deal with the matter of dumping. But until he hears from all sides it is said he will adopt no specific plans. He is expected to soon hold a conference on the subject with Chairman Kitchin of the house ways and means committee and Chairman Simmons of the senate finance committee.

The president proposes to study data submitted to him by the department of commerce, federal trade commission and also, it is said, to the proposal to make dumping punishable under the "unfair competition" clause of the federal trade act, or the "unfair trade practices" provision of the Clayton anti-trust law.

Hope for Early Decision

Washington, Nov. 2.—Interested shippers and consumers are hoping that the interstate commerce commission will render an early decision with regard to rates on pig iron from Alabama and Tennessee furnaces to eastern and New England port cities and interior points which did not get the benefit of the lowered levels applied to those general districts as the result of the original decision in the case. Reopening of the case was made after a supplemental complaint had been filed by the shippers, who are seeking to have the old relationship of rates maintained, as was done when the 35-cent reduction was applied to all points in central freight association territory, roughly described as that section lying west of Pittsburgh to the Mississippi river and north of the Ohio river.

Arguments as to rates, all-rail and rail-and-water, to New England and eastern points, were made before the commission last Wednesday.

Favors Government Plant

Washington, Nov. 2.—The propaganda begun by Secretary of the Navy Daniels in favor of a government-owned armor plate plant and a government-owned projectile plant was furthered by Senator Owen, Democrat, of Oklahoma, during a conference he held last week with Mr. Daniels. He said the construction and maintenance by the government of plants for the production of war materials would not only insure a necessary supply of reserves of munitions but would also "protect the government against the demands of a monopoly in this manufacture that was under development in this country."

The product to be made, he said, need not be necessarily completely finished product, but could be stored away in

such condition that it could be speedily completed and made available upon short notice. Senator Owen explained that he realized it would be impracticable for the government to own or construct sufficient plants to produce all the military supplies it would need in time of war, but said he believed "if there were enough factories to produce a fair proportion of the needed output, extortion on the part of private concerns would be prevented."

Again Suspended

Washington, Nov. 2.—The interstate commerce commission entered an order last Saturday further suspending from Nov. 12 until May 12, schedules naming increased freight rates on structural steel, in carloads, to north Pacific coast points, including Seattle, Wash., and various interior points. The operation of these schedules was originally suspended from July 15 and later until Nov. 12.

Called a Halt

Washington, Nov. 2. — Secretary of War Garrison has ordered that the Panama railroad continue in effect its temporary rate of $3 per ton for transshipping goods across the isthmus. The railroad had announced rates varying from $2.50 to $15 per ton would be put into effect on Nov. 1 as the result of the big slide which closed the canal to traffic. The Luckenbach Steamship Co., and other vessel interests engaged in a coast-to-coast trade, protested vigorously against the higher rates, and offered to pay the Panama railroad 18 per cent of its through rate from New York to San Francisco. Unless relief were given it from the high rates, the Luckenbach company said it would be compelled to withdraw from the trade. Secretary Garrison has asked for complete data on the situation, and until he has studied the matter more closely will not announce what rates will be applied.

Trade Commission Inquiry

Washington, Nov. 2. — The federal trade commission will soon send out 30,000 letters of inquiry, followed up by a brief schedule, as a part of the investigation of conditions that affect American foreign trade. Congress has empowered the commission to make an investigation of these conditions and to report the facts with such recommendations as it deems advisable.

By public hearings throughout the country and by other means the commission has been gathering facts and information as a basis for its report to congress. It now wishes to obtain information from a large number of men who were unable to appear at the hearings. For this purpose these letters and schedules will be sent out.

About 20,000 letters will go to American manufacturers and producers, and about 10,000 will be sent to other authorities on foreign trade conditions, such as export commission merchants, manufacturers' export agents, importers, domestic merchants, publicists, lawyers, economists, bankers, engineers, etc.

A return postcard accompanying the letter is designed to give the commission a broad yes or no referendum on the advisability of export combinations, and to put it in touch with those who are willing to assist the commission by furnishing further facts and suggestions. To those who state that they will co-operate with the commission in furnishing facts, etc., the schedule of inquiries will be sent, covering the topics on which the commission desires information.

Some of the inquiries are designed to ascertain the general understanding of business men as to whether the anti-trust laws prohibit export combinations among American manufacturers, and the views of men generally as to whether such combinations are in the public interest. Other questions are expected to develop highly interesting information in regard to "dumping" by foreigners, either in the United States or in other markets. Information is also sought concerning the operations of foreign combinations, and other conditions which affect American export trade.

A New Book on Exporting

A timely book, in view of the present attention directed to our foreign trade, is "Practical Exporting", by B. Olney Hough, a well known authority and writer on this subject, and editor of the *American Exporter*. "Practical Exporting" is a 632-page handbook for manufacturers and merchants and is issued at $4 by the *American Exporter*, 17 Battery place, New York City.

This new book represents the result of 15 years' actual experience by the author in exporting, as salesman, manufacturer and commission merchant, followed by eight years in his editorial work which has brought him in daily touch with the export problems of several hundred American manufacturers.

Of special interest to the general reader will be the chapter on "Mistaken Impressions", in which some of the most popular beliefs about our foreign trade are analyzed and shown to be based on economic fallacies. Brief quotations from leaders in the manufacturing, exporting, shipping and banking world are used to corroborate and support the author's conclusions from his own experience and research. The plan of the book is to explain logically and completely every step necessary in selling and handling goods for export.

Thirty-nine forms of export documents, reproduced in full size in facsimile, are bound into the book, printed separately on appropriate papers, through the courtesy of a number of prominent exporters, shipping firms, banks, etc.

Placed on Full Time

Indianapolis, Nov. 2. — An indication of a greatly improved business situation was shown here last week when J. W. Coneys, superintendent of the Pennsylvania lines, announced that as soon as materials can be procured the car repair department, employing more than 300 men, will be placed on full time. Orders for placing the shops on full time came from high officials of the railroad system, who placed no restrictions on the local officials on the number of men to be employed. It was said that on account of a scarcity of materials it would be a short time before the local shops are in full operation. It is understood that the orders are a part of the company's plan to build up a depleted equipment of rolling stock. Business is brisker at the Beech Grove shops of the New York Central lines than at any time during the last two years, the Big Four having recently begun the manufacture of locomotives there.

Turning Out Shells.—The S. A. Woods Machine Co., South Boston, Mass., is turning out about 1,000 shrapnel shells a day under its contract with the Russian government. The contract covers 500,000 shells at a price of $60 each, or $3,000,000 in all. The factory does not make the entire shell, but receives the rough body from an Ohio manufacturer and completes the shell with the exception of inserting the powder. The company is enlarging its capacity by installing new machines and plans to produce lathes for shell work.

Carbo Steel Post Co., 538 South Clark street, Chicago, has changed its name to the Carbo Corporation.

Busy Machine Tool Builders Meet

Looking to the Future, Possibilities of Trade in China and South America Are Considered—Important Report on Apprenticeship

DESPITE record-breaking schedules of production at machine tool plants throughout the country, and serious labor troubles causing anxiety to many manufacturers, a large attendance featured the fourteenth annual convention of the National Machine Tool Builders' Association, held Oct. 28 and 29 at the Hotel Astor, New York. Of the four sessions, two were allotted as usual to simultaneous meetings of the various machine tool committees. The two general sessions were devoted to a comprehensive report by the apprenticeship committee, which detailed the recent activities of the conference board of training of apprentices; to a survey of conditions in China and South America, with special reference to possibilities for extending the demand for American machine tools in these countries, to the framing of a clause, which hereafter shall be included in government proposals, providing the deliveries quoted are for acceptance within ten days, and to other matters. Officers were elected for the ensuing year and Cincinnati was selected as the place of the next meeting.

President Viall's Address

In his opening address, the retiring president, W. A. Viall, of the Browne & Sharpe Mfg. Co., Providence, sketched briefly the course of the machine tool industry during the past two years. At the time of the annual meeting in 1913, he said, the depression had begun to set in. At the time of the April, 1914, meeting, the question as to when business would revive had become serious, as many machine tool manufacturers had come to the point where they felt they could not afford to increase the accumulation of stock goods. At the October meeting last year, some of the members had begun to get rather busy and all were very keen to follow all scents that led toward a discovery of persons holding orders.

"Few of us, at that time, had any idea of what was in store for us," said Mr. Viall. "Most of us were running short-handed and the occasion had not yet arisen to warrant our adding to our forces or in many cases to our hours of operation. At Atlantic City this year, we met to find that all of our plants were in full swing—crowded in a way that we never had been crowded before—and that we were compelled to reject orders that were offered, simply because we could not take care of our customers. This has continued until the present time. We now find ourselves busy—hardly a section that is represented by our membership is without distinctly disturbing elements in the way of labor troubles. As our organization, however, is one that is not concerned with the question of labor, but tries to confine itself to the commercial side of the industry, this question will not be dwelt upon at this time.

"The past few months have emphasized the point that the machine tool industry is a fundamental, if not the fundamental, industry among the industries of the world. While it has been necessary to provide food and clothing for the armies, ammunition and arms have been entirely dependent upon machine tools and as much or more interest has been centering around the machine tool industry than around the direct manufacture of arms."

Bloody History

(From President Viall's Address.)

There is a saying to the effect, "Happy the Land that has no History".

Perhaps at no time have we been able to appreciate the truth of the saying more than at the present time.

A country in which the people are living in a quiet way may be accomplishing a great many things that do not show up large in the pages of history, but their lives are happy; while much so-called fame is built up on deeds of war rather than on deeds of quietness.

"Men who have some mechanical taste and ability, combined with executive ability, find in the machine tool industry the broadest fields for work that is not only congenial but extremely profitable," Mr. Viall said. "There are opportunities for men who have distinct commercial proclivities when their tastes are mechanically inclined. The industry needs more and more men who are good, clear thinkers; men who are able to consider the economical as well as the various mechanical questions that come up. Aside from the media of apprenticeship, part-time schools, continuation schools, etc.," said Mr. Viall, "there is a line of attack that can be used in interesting young men and that is in placing before men who are making their decision as to the course they are to follow in life, a picture of what the machine tool industry stands for, since, as has been brought out many a time, the industry in the main has been started by men with little or no capital and to whom the application of brains and hard work has brought visible rewards. To the honor of the industry," added Mr. Viall, "it can be said to be a 'square' one, for machine tool manufacturers do not attempt to sell goods that contain a percentage of less than 100 of the material that is claimed for them to contain.

"At this time, there are many who are interested in welfare work, and by welfare work, I do not mean any of the sentimental, useless work that is being done at times, but the class of work that tends to the helping and upbuilding of those that work for it and of those who are intended to be helped," said Mr. Viall. "Is there an industry where there are greater opportunities to come in first-hand touch with men who need guidance of this higher, non-parental type than in our industry and where men can be developed on these lines which make them more useful to themselves and to the community at large? I appreciate that many of these facts would not appeal to an ordinary workman, as his main efforts are to get through with as little work as possible and to stand ready to 'do' his employer whenever opportunity arises; but it seems as though they would appeal—and in fact they do appeal—to some of the men who are looking about to settle themselves in work in which they can grow and make themselves useful."

"Mushroom Plants"

General Manager Charles E. Hildreth, of the Whitcomb-Blaisdell Machine Tool Co., Worcester, in a brief report, said the association has enabled its members during the past year to cope with an unprecedented situation in a way that would have been impossible had each machine tool house acted without the co-operation of others. Mr. Hildreth called attention to the many new machine tool concerns which have gone into business recently and which he

classed as "mushroom growths" created by the war demand. These concerns, he said, need the assistance and co-operation of their competitors to the end that they may learn correct methods of computing costs and thus avoid becoming a menace to the industry as a whole. The tariff question, said Mr. Hildreth, is a matter to which the association should direct its attention during the coming year.

An important resolution adopted provided: That all proposals made to the government, municipalities and others who ask for proposals on a fixed date shall contain a clause to the effect that the deliveries quoted are subject to acceptance within ten days from the advertised date of the opening of bids. Frequently the government holds up awards for an indefinite period following the opening of bids and during this period the bidder naturally must hold himself prepared to adhere to the terms he quoted. The clause described in this resolution was designed especially to protect the manufacturers in times like the present, when deliveries constantly are being disposed of farther into the future.

Another resolution adopted related to the controversy between the postoffice authorities and certain members of congress, on the one hand, and the railroads on the other, in regard to methods of computing rates of mail pay. Any rate of mail pay which did not remunerate the railroads for the service rendered, and was established to aid in making a good financial showing for the postoffice department, it was said, must be made up by freight and passenger rates. The resolution protested against any unfair increase in freight rates to make up for low mail rates. Copies of this resolution will be sent by the various machine tool manufacturers to their respective congressmen.

The New Officers

The new president is J. B. Doan, of the American Tool Works Co., Cincinnati, who has been a member of the association since its formation 14 years ago, having taken a prominent part in its activities during all of that time. D. M. Wright, of the Henry & Wright Mfg. Co., Hartford, Conn., was elected first vice president and A. H. Tuechter, of the Cincinnati Bickford Tool Co., Cincinnati, second vice president. A. E. Newton, of the Reed, Prentice Co., Worcester, Mass., was re-elected treasurer, and Charles L. Taylor, of the Taylor & Fenn Co., Hartford, secretary. Charles E. Hildreth again urged during the meeting that he be succeeded in the office of general manager by a practical man who could devote all of his time to the work. This suggestion did not meet with any encouragement and the feeling of the members generally appeared to be reflected in the remark of J. N. Heald, of the Heald Machine Co., Worcester, who said, "15 minutes of one man's time might be worth a whole day of another's."

One New Member

The only new concern to be admitted into the ranks of the association was the John B. Norris Co., whose application for membership was accepted. The application of several other concerns were reserved for future action. An important action of the executive committee was the decision hereafter to refer all applications for membership to the committees having charge of such machine tools as are produced by the prospective new members.

The report of the apprenticeship committee made public for the first time the details of recent activities of the conference board on training of apprentices, made up of representatives of the National Association of Manufacturers, National Founders' Association, National Metal Trades Association, National Machine Tool Builders' Association and the United Typothetae and Franklin Clubs of America. Following a number of meetings, the board, on May 25, agreed upon a number of suggestions. It was voted that a completed grammar school education or its equivalent should be made, where possible, a requirement for entrance upon an indentured apprenticeship, that indentured apprentices should receive correlated classroom instruction, that such instruction should be given, wherever possible, during working hours, and that apprentices should be paid the same wages for time spent in instruction as when engaged in practical work. It was voted apprentices should be paid only such wages as are stipulated in the agreement of apprenticeship, that an initial period of not less than 1,000 and not more than 2,000 working hours shall constitute a trial period for apprentices and that in each employment where apprentices are being trained an expert should be selected to be responsible for their training. It also was voted that apprentices should not be required to make any money deposit upon entering on their apprenticeship, but that they should receive a cash bonus, at the rate of $25 for each full year of apprenticeship, upon the satisfactory completion of their course of training.

Dr. W. C. Huntington, commercial agent in charge of the Chicago office of the bureau of foreign and domestic commerce, United States department of commerce, brought to the attention of the association a large amount of information compiled during the South American trip of J. A. Massel, special agent of the department of commerce, charged with investigating the market for machine tools. Mr. Massel spent upward of a year in the Argentine, Chile and Peru. The Argentine, as shown by Mr. Massel's report, afforded the greatest possibilities for an extension of our South American machine tool business. This country is largely agricultural and due to the great European demand for food products from the Argentine, that country practically has recovered from the effects of the war and its currency is extremely stable. There is practically no building of machine tools in the Argentine and indications are that there will not be any. The machine tools mostly used are such as are needed in repair shops and it is not likely that country will afford a market for highly improved and specialized tools. Dr. Huntington described the methods by which Germans during late years have captured a great deal of trade in the Argentine, advising that these methods be followed by American machine tool manufacturers.

Chile, he said, is a one-product country and depends for its prosperity largely on the nitrate of soda industry, which has been curtailed greatly as a result of the war. The market for machine tools in Chile is approximately one-third of that in the Argentine. The tools required in Chile also are of the type generally used in repair shops. The tools generally required in Peru also are of this character. The market for such tools in Peru, said Mr. Huntington, is approximately one-twelfth the size of the Argentine market. Dr. Huntington called attention to exhaustive lists of machine tool dealers in the three South American countries, together with notes as to their financial strength and their standing in the community. These will be published by the department of commerce and will be sent, confidentially, to American machine tool manufacturers.

Urges Co-Operation

The only way to sell goods in South America at present, said Dr. Huntington, is for non-competing concerns to organize a co-operative group and to employ a competent, resident general sales manager, who should receive a liberal salary and expenses. Such a co-operative group, he said, should carry a stock in each country and matters of credit and general terms of payment should be left entirely to the sales manager. The latter, he said, should be able to speak Spanish and be able to understand the ways and customs of the people. Dr. Huntington emphasized the

point that in going after the South American trade American manufacturers must follow precisely the same methods they would pursue in endeavoring to develop trade in a new territory in this country. Thus, in South America, it would be necessary, at least in a great many cases, to grant the terms of credit to which buyers there have become accustomed. He said our manufacturers rapidly are acquiring a reputation of desiring to do business only on cash terms and in this connection he mentioned the recent suggestion of an Australian buyer that the motto on our coins he changed to read: "In God We Trust—All Others Pay Cash in New York."

General Manager Hildreth read an interesting letter from Frank A. Foster, a graduate of the Worcester Polytechnic Institute, who now is located in China. This letter described conditions prevailing in China as a result of the European war, the efforts which are being made to produce in China those articles which formerly were obtained in Japan and many other matters of interest to American machine tool manufacturers having in mind a future extension of the Chinese market for their products. The letter described a number of representative Chinese machine shops, equipped with very primitive apparatus. Mr. Foster believed the possibilities for extending the demand for American machine tools in China are very considerable and he recommended that when the present conditions caused by the war demand for machine tools are succeeded by a lull in this country, efforts be made in this direction. He strongly recommended that at some future time, manufacturers here take up the question of equipping a Chinese technical school with representative American equipment.

The convention committee were as follows: Nominating, P. G. March, American Shaper Co., E. J. Fullam, Fellowes Gear Shaper Co., O. P. Iles, International Machine Tool Co.; Auditing, J. W. Carrel, Lodge & Shipley Machine Tool Co., E. C. Woolgar, National Acme Mfg. Co., A. H. Tuechter, Cincinnati-Bickford Tool Co.; Resolutions, Wm. Lodge, Lodge & Shipley Machine Tool Co., Chas. H. Alvord, Hendey Machine Co., T. C. Dill, T. C. Dill Machine Co., Inc.

Many Thousands Saved

By Uniform Contract of National Supply and Machinery Dealers' Association

Earnest discussion of problems vitally affecting the distributing end of the machine tool business featured the fall meeting of machine tool dealers held on Oct. 28 at the Hotel Astor, New York, under the auspices of the National Supply and Machinery Dealers' Association and presided over by W. J. Radcliffe, of the A. E. Kinsey Co., Cincinnati, first vice president in charge of machinery interests of the association. The report of the secretary, Thomas A. Fernley, stated the members of the association during the year have been conducting a business which exceeded in volume anything previously known in the trade. During this period, dealers have moved goods which they have carried in stock for a long time and many members, through the instrumentality of the association, have been relieved of overstocks which they have carried for a period of years. The secretary reported that frequent calls have been made for copies of the uniform contract adopted some seven years ago by the machine tool dealers and the machine tool builders, and that the specific statements in that contract relative to the method of handling questions that might arise regarding territory in which machine tools were shipped, the rights of the various dealers, etc., had resulted in saving scores of thousands of dollars to dealers. Manufacturers who have looked carefully into the situation, said Mr. Fernley, freely concede that machinery can be distributed more economically through the dealer than direct from the factory through individual salesmen, and the recognition of this fact has created a far more satisfactory situation than existed some four or five years ago.

Discussion indicated that the greatest problem which confronts the machine tool dealers today is to get machines, and as a result of the rushed manufacturing conditions and the strikes which prevail at many plants, they are behind in deliveries to their customers. Considerable discussion was given the question whether or not there will be a surplus of tools on the market when the war ends. Many of the members were of the opinion that the employment of unskilled labor for the operation of machines on war munitions, as well as the severe service to which these machine tools are subjected, will result in heavy depreciation, so that many of the machine tools now used in the manufacture of war munitions will be unfit for further service. The dealers considered it a businesslike policy to make buyers adhere closely to terms of payment. In most cases, it was stated, buyers who in normal times adhered to their terms now get tools in preference to buyers who are not so careful in this respect, and buyers who come within the latter category usually are asked to make a cash deposit when placing the order. The question of what will be done in regard to machine tools which shall have been contracted for at high prices when the present war terminates, was considered and the belief was expressed that the manufacturers would protect the dealers against any decline in prices which might follow. Many dealers reported they are asking special terms and cash deposits on orders involving machine tools which no longer would be desired in case the war came to an end. Henry Prentiss, of the Prentiss Tool & Supply Co., New York, delivered an interesting address on "An Efficient Selling Organization". He said in part:

"How shall we secure a capable selling organization which is growing constantly in efficiency? I believe it is almost the universal experience of members engaged in marketing machine tools that the successful salesmen come up from the ranks, or, in other words, they are not readymade, but grow up into usefulness. It is of primary importance in selecting such men to be sure of these qualifications—that they are equipped with the temperament, initiative and character required, together with a good English education as well as a good understanding of mathematics, and these endowments should be supplemented by practical experience in the construction and application of machine tools. It is not easy to find such men, which makes it all the more necessary that we should be at all times alert to this need, so as not to miss an opportunity of supplying it. If our selections do not have the technical knowledge and mechanical experience required, then, if equipped with the other necessary qualifications of salesmanship, they should be willing to acquire the lacking essentials by devoting the necessary time and effort to obtain these. If we strengthen our present selling organization with men of this type, this policy surely will bear the expected fruitage. It takes time to accomplish this, as it does everything worth having, but the final result is sure. It is less and less a

question of price in effecting sales of machine tools at the present day; such sales hinge upon the ability of the salesman to convince the prospective buyer of the merits of the tools he offers, regardless of price, as an investment—a productive unit in his plant.

"The successful salesman today must also be able to suggest to the user, as conditions warrant, changes in his equipment which will lower manufacturing costs to meet competition and thus protect, if not increase, net profits.

"A selling organization of this nature can be built up only by inaugurating and following persistently a settled policy, which is expressed in employing only salesmen of good ability and experience or such as can develop these qualifications rapidly; men of intelligence and trustworthy, who in the use of this equipment are able to gain and hold the confidence of their patrons, already secured and in prospect.

Such an organization, with a business founded on principle rather than expediency, and with equally efficient vmethods employed in all other departments of our business, will give us a well-earned satisfaction and assured success."

Thomas Iron Co. Optioned

To an Ohioan Representing New York Capitalists—Other Negotiations for Ore and Furnace Properties

No definite information yet has been acquired by the iron and steel trade regarding the identity of the manufacturing and financial interests which have been optioning blast furnace and iron ore properties in eastern Pennsylvania and New Jersey or the ultimate aim that is represented in these negotiations.

Considerable progress has been made in preparing the way for the eventual purchase of these plants, should that step be decided upon finally by those shaping this proposition. At a meeting of the stockholders of the Thomas Iron Co., held at Easton, Pa., Oct. 27, it was voted to grant a month's option on the company's entire holdings, to Mills L. C. Kachelmacher of Columbus, O., representing New York capitalists at a purchase price of $3,000,000, plus the inventory. It is figured this will mean from $55 to $60 per share of the $2,500,000 capitalization of $50 par value. The original offer for the Thomas holdings of Mr. Kachelmacher and his associates, which the meeting of stockholders was called to consider, was $45 per share. Before the meeting, however, Wm. Rice Taylor, a stockholder who previously had protested against the acceptance of the $45 offer on the grounds that it was too low, had procured a bid of $50 per share from Frazier & Co., Philadelphia bankers. The Kachelmacher interests then raised their price to the figure given. The Thomas company stockholders have not been advised as to the identity of those who are seeking to acquire their properties.

It is learned that the same parties who have been granted an option on the Thomas Iron Co. properties are the ones who have taken an option from the heirs of the late Joseph Wharton, on the three idle furnaces and ore mine at Wharton, N. J., of the Wharton Steel Co. Furthermore, the same interests have made overtures to option the plants of the Empire Steel & Iron Co., consisting of extensive ore operations at Oxford and Mt. Hope, N. J., and six blast furnaces, three of which are at Catasauqua, Pa., and the others at Oxford, N. J., Topton, Pa., and Macungie, Pa. Three of these furnaces now are in blast. The Mt. Hope mines recently have been rehabilitated and enlarged, and now are one of the largest and most up-to-date operations in the New Jersey ore fields. The company has a capital of $5,000,000 of which $4,781,400 is outstanding. The matter of an option has not yet been brought by the officials of the company to the attention of the stockholders of the Empire company.

The fact that in all cases where options have been taken or sought, ore mines are included has given rise to the report that the real prospective purchasers are connected with the new Midvale Steel & Ordnance Co., which now controls the Worth furnaces at Coatesville, located within easy haul from these deposits. Officials of the latter company, however, give no support to these rumors.

Another Eastern Negotiation.

Another new negotiation for iron and steel works under way in the east is the effort of several different groups of capitalists to obtain control of the plant of the New York State Steel Co. at Buffalo. The works consist of one blast furnace 85 x 21 feet, built in 1906, an open hearth plant of two 200-ton Talbot basic furnaces, and a 2-high 36-inch blooming mill with a rated output of about 100,000 to 120,000 tons annually of billets, blooms and slabs. This company first went into the hands of a receiver in 1907, was discharged later and again in 1913 was placed in receivership, which continues. The steel works last were operated about April 1, 1913. Since then, the entire plant has been idle.

Shell Orders

In Large Quantities to be Placed in Canada

Toronto, Nov. 2.—Col. Frederic Nicholls, acting president of the Dominion Steel Corporation, stated to your correspondent that the plant was operating to full capacity in every department. In addition to the ordinary output, large quantities of benzol and toluol are being made as by-products of the coke ovens. The company has not hitherto engaged in the manufacture of shells, but has submitted a tender to the shell committee which if accepted will enable it to undertake this branch of manufacture on a large scale.

Orders for shells to the amount of $80,000,000 are being placed by the shell committee at Ottawa, who are considering some 400 tenders, all the big iron and steel firms being represented. The tenders are all submitted for approval to Sir Frederick Donaldson and Lionel Hichens, head of the Cammell-Laird Co., munition experts, who are now associated with the shell committee, and it is understood that the prices hitherto charged will be considerably scaled down.

At the recent annual meeting of stockholders of the Carbon Steel Co., Pittsburgh, the following directors and officers were re-elected for the ensuing year: President, Charles McKnight; vice presidents, Gilbert G. Thorne and George S. Macrum; treasurer, Dean R. Wilson; secretary, W. W. Noble; executive committee, Charles McKnight, Dean R. Wilson and Charles E. Middleton; board of directors, Gilbert G. Thorne, Edward C. Hoyt, Charles McKnight, Edward F. Slayback, George S. Macrum, Dean R. Wilson and Charles E. Middleton.

Members of the Illinois Manufacturers' Association and other manufacturers and representatives of commercial organizations recently occupied three special cars on the B. & O. railroad from Chicago to Philadelphia Sunday night, Oct. 17, going to the sessions of the National Safety Council, held last month.

Scarcity of Steel Felt in England

Immense Demand for War Purposes—Pig Iron Market Stronger—Advance in Steel Making Grades

Office of *The Iron Trade Review*,
Prince's Chambers, Corporation street,
Birmingham, Eng., Oct. 27.

THE war continues fertile in surprises, and the swift developments keep us all on the tenterhooks. Undoubtedly, Germany's new outbreak in the Balkans has caused some depression, but a considerable proportion of critics, who have shown some title to consideration, regard this development as conceivably shortening the war since it must leave Germany less able to resist the attacks on her eastern and western fronts while her position in the Balkans is such that she cannot afford to fail. Her action is interpreted as that of the gambler who stakes all on a single cast. The recruiting campaign has led to a marked revival of enlistments, and for the time being has discounted the clamor for conscription. But there is a deepening impression that the British must be prepared to swallow their prejudices, if the present effort does not bring the accession of strength called for by Lord Kitchener. The spirit of sacrifice is strengthening, and we are gradually realizing that the sacrifices already made may well be trifling compared with those yet to come.

Pig Iron Recovery

Recent expectations that a recovery in pig iron might be looked for have been realized this week. For several days increasing firmness has been manifest in the Cleveland market, and this has reacted upon consumers, who have been running risks by allowing their contracts to expire. That market has been assisted by some improvement in export business, which may possibly be due to increasing confidence as to safety at sea. For the past week or two, submarines have very nearly ceased from troubling, and are almost forgotten. This has encouraged confidence in shipments, including those of pig iron. In fact, those for the first half of the month have been decidedly the best of the year. Up to Saturday last, the total was 13,000 tons, and the same rate of shipment is being well maintained. Stocks are also decreasing slightly. The present total is 138,000 tons. Speculators have now entered the market and are doing something to stimulate business. Today's quotation was 65s 6d ($15.72), the best for some time.

The quarterly meeting at Birmingham today afforded a good opportunity to test the position. A number of makers quoted their prices for Northamptonshire and Derbyshire iron 1s 24d above last week's quotation. There is no evidence that advances were actually realized, but this token of increasing firmness was regarded as genuine. The smelters have received a stimulant in a rise of half a crown (60c) a ton in the price of coke as compared with a week ago, and they are feeling the pinch of higher wages. Apparently they realize that a crisis has come when they must either obtain better prices or shut down.

Lazy Workmen

Makers of common iron were loud in their complaints of the troublesome and unpatriotic attitude of the workmen. Scarcely a puddler does a full day's work. Often he gets tired when the shift is half or three-quarters through, and this not only reduces output, but involves expenditure on fuel in keeping furnaces in for several hours until the next shift. At one large works the time losses this week resulting from this cause totaled at least one-sixth of the week. This is especially irritating when customers are clamoring for iron. But employers are helpless, the workmen in these times being entirely a law unto themselves. The same complaints apply to the coal trade, output being deliberately restricted at the pits.

There has been a marked improvement in the price of hematite, and this week mixed numbers of East Coast material have been quoted at 102s 6d ($24.60). This is only partly due to increased demand, an important element being the scarcity of shipping to bring in the ore from Spain. Difficulties are so great that makers are inclined to appeal to the government, as they did some time ago, to assist them by providing shipping. For the special descriptions of high class hematite produced in the northwest of England, the demand is increasing and most of the furnaces are in arrears with deliveries. One furnace has gone out of blast, leaving only 22 making iron. The greatly enlarged demand for steel for war purposes is increasingly felt in the hematite department.

Finished Iron and Steel

In all branches of the finished iron and steel trades, another upward movement appears to have set in. Today's quarterly meeting showed strength in all departments, and in some directions ominous signs of impending scarcity.

The quarterly meetings during the war have developed a different character from those prevailing in peace times. At today's meeting, for example, not a single foreign buyer appeared to be represented. Foreigners now realize that as far as the Midlands are concerned there is very little hope of their requirements being met. Several advances have taken place. Of these the most interesting is that of marked bars. Prior to the meeting the makers of best iron announced a rise of 10s ($2.40) per ton making the standard £12 10s ($60). Everybody expected a rise of at least £1 (4.80) per ton. The extreme modesty of the makers is not quite explicable. Makers of common iron are already closely on their track, some of them obtaining £12 5s ($57.80) where the material is much wanted, although £12 ($57.60) is the more general figure. Less important advances were those of £1 ($4.80) on tinned sheets and lead-coated sheets.

In galvanized sheets, prices are being slightly reduced owing to a fall in spelter values. Galvanized sheets can now be bought for £17 ($81.60). But the period of very high prices has stimulated the transfer from a galvanized covering to a paint covering as a rust resister. The government, which is a heavy buyer for soldiers' huts and sheds of various sorts, has shown a marked preference for painted sheets. They can get these for about £6 ($28.80) per ton less, and apparently consider that for the comparatively short life anticipated for the soldiers' huts these sheets will do just as well as galvanized sheets. A great deal of concern is manifested over the scarcity of steel. This material is in immense demand for a great variety of war purposes, and,

on the whole, the supply has been wonderfully well kept up. Complaints of scarcity this week are highly significant and are attributed partly to the immense activities in the production of shells. Lloyd George's department has lately been making things hum, and if report be true, steel supplies have here and there given out. The shell makers at one factory are said to have had three days' idleness for lack of shell steel. This may perhaps account for the report that some steel works have been commandeered by the government. I hear on very good authority that the French and English governments are now considering the situation together from the point of view of steel supplies, and a conference of steel makers is to take place during the coming week. We are prepared to hear that non-war requirements will be met with further restriction of supplies. An immediate effect of the scarcity has been a rise of at least 10s ($2.40) per ton in ordinary bessemer billets which on the Birmingham market today were quoted at £8 5s ($39.60) per ton. It was impossible to get any quotation for open hearth steel, the government having laid hands on all the material available.

New Names

Added to Membership of American Iron and Steel Institute

A total of 76 new names have been added to the active and associated classes of members of the American Iron and Steel Institute. Final action on a number of these new members was taken in connection with the general meeting at Cleveland last week. The list of new members is as follows:

ACTIVE MEMBERS.

Edward H. Bindley, vice president, Pittsburgh Steel Products Co., Pittsburgh.

Henry Payne Bingham, assistant treasurer, the Upson Nut Co., Cleveland.

David Allan Burt, treasurer and auditor, La Belle Iron Works, Steubenville, O.

Harold Tripp Clement, assistant treasurer, Rogers-Brown Iron Co., Buffalo.

Chancey A. Cochran, second vice president and secretary, the Youngstown Iron & Steel Co., Youngstown, O.

William Carey Coffin, vice president, Knox Pressed & Welded Steel Co., Pittsburgh.

Edward C. Collins, traffic manager, Pittsburgh Steamship Co., Cleveland.

Albert Leighton Cromlish, superintendent, blast furnaces, Carnegie Steel Co., Farrell, Pa.

Wilbert F. Davis, superintendent, Bessemer and open hearth departments, Cambria Steel Co., Johnstown, Pa.

Isaac H. Denton, manager of sales, the Ohio Seamless Tube Co., Cleveland.

C. L. Gillespie, general superintendent, Texas Carnegie Steel Association, Galveston, Tex.

Ralph Clark Glazier, superintendent blast furnaces, Cambria Steel Co., Johnstown, Pa.

William McK. Green, the Cleveland-Cliffs Iron Co., Cleveland.

Harry W. Haggerty, salesman, Corrigan-McKinney & Co., Cleveland.

Erasmus Ferharde Jones, salesman, Republic Iron & Steel Co., Cleveland.

John H. Kennedy, manager, Rogers-Brown Iron Co., Buffalo.

Harry J. Koch, secretary, Fort Pitt Steel Casting Co., McKeesport, Pa.

Maurice D. Langhorne, blast furnace superintendent, Pulaski Iron Co. of Virginia, Pulaski, Va.

Roland S. LeBarre, assistant manager of sales, Carnegie Steel Co., Cleveland.

John Fellows Lewis, assistant superintendent steel works, American Steel & Wire Co., Cleveland.

Louis N. McDonald, superintendent bessemer and open hearth department, Carnegie Steel Co., Youngstown.

James S. McKesson, resident manager, Corrigan, McKinney & Co., Pittsburgh.

Alonzo C. Morse, general manager, the Ohio Seamless Tube Co., Shelby, O.

George W. Nichols, secretary, Stewart Iron Co., Ltd., Cleveland.

David Z. Norton, Oglebay, Norton & Co., Cleveland.

Claude J. Peck, manager of Cleveland office, Shenango Furnace Co., Cleveland.

B. E. Pheneger, superintendent blast furnaces, American Steel & Wire Co., Cleveland.

Paul Peter Beese, superintendent, open hearth Nos. 1 and 2, Homestead Steel Works, Carnegie Steel Co., Munhall, Pa.

Edgar D. Rogers, general manager of sales, United Steel Co., Canton, O.

William Silliman Rogers, assistant to president, Rogers-Brown Iron Co., Buffalo.

Edwin G. Rust, general superintendent, Wheeling Steel & Iron Co., Wheeling, W. Va.

Ernest M. Sprague, contracting manager, American Bridge Co., Cleveland.

H. B. Weatherwax, general superintendent, Chateaugay Ore & Iron Co., Albany, N. Y.

Robert B. Wolcott, sales agent, Carnegie Steel Co., Portland, Ore.

Charles L. Wood, sales department, Carnegie Steel Co., Pittsburgh.

Truman S. Woodward, chief chemist, Ohio Works, Carnegie Steel Co., Youngstown, O.

ASSOCIATE MEMBERS.

William H. Allen, superintendent, By-Products Corporation, Chicago.

Herbert A. Anderson, publisher, *The Blast Furnace and Steel Plant*, Pittsburgh.

A. O. Backert, vice president, the Penton Publishing Co., Cleveland.

T. F. Baily, president, the Electric Furnace Co., Alliance, O.

Merrill G. Baker, assistant general manager of sales, American Vanadium Co., New York City.

Clyde Brooks, secretary, Pittsburgh Iron & Steel Foundries Co., Midland, Pa.

Alexander C. Brown, vice president, Brown Hoisting Machinery Co., Cleveland.

Gilbert Butler, treasurer, the Bossert Co., Utica, N. Y.

C. D. Caldwell, sales manager, Chicago.

David J. Champion, rivet manufacturer, Cleveland.

Henry Chisholm, rivet manufacturer, Cleveland.

Samuel G. Cooper, 1407 Oliver building, Pittsburgh.

Frederick H. Eaton, president, American Car & Foundry Co., New York City.

ASSOCIATE MEMBERS ELECTED OCT. 22, 1915.

L. H. Elliott, secretary, Bourne-Fuller Co., Cleveland.

John N. Goddard, manufacturer, banker and merchant, Third National Bank building, Atlanta, Ga.

William W. Hanlon, superintendent steel works, National Enameling & Stamping Co., Granite City, Ill.

Charles William Heppenstall, general manager and treasurer, Heppenstall Forge & Knife Co., Pittsburgh.

Wilson B. Hickox, the Hamill-Hickox Co., Cleveland.

Henry Manning Kelly, manager, Lloyd-Booth department, United Engineering & Foundry Co., Youngstown, O.

Harry Wheelock King, president, King Bridge Co., Cleveland.

John Lambert, capitalist, Chicago.

John Henry Long, salesman, United Engineering & Foundry Co., Youngstown, O.

Clayton Mark, vice president, the National Malleable Castings Co., Chicago.

Domenico Martignone, electrical engineer, General Electric Co., Cleveland.

Edwin H. Martin, metallurgical engineer and chemist, 1915 East Ninety-seventh street, Cleveland.

Gilston B. Morris, secretary, Morris & Bailey Steel Co., Pittsburgh.

William J. Morris, Pittsburgh, president, Morris & Bailey Steel Co., Pittsburgh.

Talbot E. Pierce, superintendent, Semet-Solvay Co., Cleveland.

Henry F. Pope, president, the National Malleable Castings Co., Cleveland.

Charles J. Ramsburg, vice president, H. Koppers Co., Pittsburgh.

J. W. Richards, professor of metallurgy, Lehigh university, South Bethlehem, Pa.

E. Marshall Rust, engineer, the Rust Engineering Co., Pittsburgh.

Robert Ripley Rust, general manager, Central Foundry Co., 90 West street, New York City.

S. Murray Rust, Engineer, the Rust Engineering Co., Pittsburgh.

Mason H. Sherman, general manager, by product coke operation, Chicago.

Samuel Lewis Smith, vice president, the National Malleable Castings Co., Cleveland.

Alfred H. Swartz, salesman, Westinghouse Electric and Mfg. Co., Pittsburgh.

E. L. Whittemore, chairman of the board, the National Malleable Castings Co., Cleveland.

John T. Wilkin, vice president and mechanical engneer, Connersville Blower Co., Connersville, Ind.

William Hartman Woodin, assistant to president, American Car & Foundry Co., New York City.

Will Make Engines.—The Hendee Mfg. Co., Springfield, Mass., will probably manufacture aeroplane engines soon for the new company which was organized recently in New York by financiers to take over the Wright Co., Dayton, O. The new company already has an order for 1,000 machines for belligerent powers, and is expecting to secure contracts for many more. The Hendee Co. also expects to secure sub-contracts of a similar nature from the Electric Boat Co., which has done a big war business the past few months.

The Girard Iron Works has acquired from Leonard Rice, a foundry plant at the corner of Allegheny avenue and Twenty-second street, Philadelphia. The plant consists of a 2-story foundry and other buildings on a plot with a frontage of 240 feet.

Iron and Money: Fact and Comment

War Stocks Not So Strong and Some Record Declines—Steel Common's Moderate Advance

WAR STOCKS did not monopolize interest in the stock market last week. Some of them, notably Bethlehem Steel, made sharp declines. Railroad shares were more prominent. The declaration of a 50-cent dividend on Great Northern Iron Ore Properties, the first dividend on the certificates since Christmas time last year, was announced. It involves the distribution of $750,000.

Buying started with considerable spirit Monday, but the weakness of sterling had a depressing effect and the close was irregular. The rail shares, however, made a good showing.

When the decision of the directors of the United States Steel Corporation not to declare a dividend on common stock in spite of the splendid showing of earnings was made public, Steel common declined 1⅜ to 84½, but this decline was more than regained during the week.

The announcement of Mr. Schwab, indicating that there is not to be a recapitalization of the Bethlehem Steel Co., had a depressing effect Wednesday, but the report that the Thomas Iron Co. is to pass under the control of Bethlehem counteracted the depressing news.

Railroad stocks were strong Thursday, but war securities showed a tendency toward weakness. Sterling made a moderate recovery on the first call for funds from subscribers to the half-billion bond issue. Russia, in applying for credit in the east, offers the highest rate of interest paid by any belligerent, 9 per cent. The loan will be for 18 months and will probably be for $50,000,000. Bethlehem slumped Friday, but the market showed that it did not take much stock in talk about peace.

The so-called war stocks again took the lead Friday. The announcement of the large rail order of the Pennsylvania was received with much favor. United States Steel was very strong.

The market Saturday was a rather quiet one. Bethlehem Steel dropped about 18 points and there seemed to be an end for a time of the undue excitement about this company's stock.

Quotations at the close of business Oct. 30 and changes in the leading stocks identified with the iron and steel industry are shown in the following table:

	Close Oct. 30.	Net change.
American Can	62	—1⅛
American Can, prfd.	107¼	.....
Amer. Car & Fdy. Co.	87½	+3
Amer. Car & Fdy. Co., prfd.	117⅛	+1⅜
American Locomotive	70½	—2⅜
American Locomotive, prfd.	99⅛	+ ⅛
American Steel Foundries	68½	—4⅞
Baldwin Locomotive	134½	—6½
Bethlehem Steel	524¾	—60¼
Bethlehem Steel, prfd.	168	—14
Colorado Fuel & Iron	57½	—1¼
Continental Can	99¾	—5¾
Continental Can, prfd.	106	—1
Crucible Steel	85	—9
Crucible Steel, prfd.	107⅝	—1⅜
General Electric	182	+5½
International Harv. of N. J.	111	+ ¾
International Harv. Corp.	68	—2
Lackawanna Steel	84	—1
Nat'l Enamel'g & St'mp. Co.	34	+ ¼
Nat'l Enam. & Stp. Co., prf.	91	.....
Pressed Steel Car	72⅛	+ ⅛
Pressed Steel Car, prfd.	105⅞	+ ⅞
Pullman Palace Car	168	+2
Republic Iron & Steel	54¼	— ⅜
Republic Iron & Steel, prfd.	104	.....
U. S. Cast Iron Pipe & Fdy.	30⅜	+3⅜
U. S. C. I. P. & Fdy., prfd.	52½	+5
United States Steel	88	+1½
United States Steel, prfd.	116⅞	+1⅜
Westinghouse Mfg.	72¾	— ⅛

The following table shows changes in maximum quotations of stocks not listed on the New York stock exchange:

	High Oct. 29.	High Oct. 22.
American Radiator	360	356
American Ship Building	40	36¾
Cambria Steel	69¼	69
Chicago Pneumatic Tool	87½	88
Inland Steel	....	298½
La Belle Iron Works	58	55
Lake Superior Corpn.	9⅞	9¾
Pennsylvania Steel	100	98
Stewart-Warner Speed. Co.	76½	76¾
Warwick Iron & Steel Co.	10¾	10½
Westinghouse Air Brake	143¾	144
Westingh'se Elec. & Mfg. Co.	74½	73

Schwab's Statement

Charles M. Schwab has sent out a letter to about 100 individuals, banks and brokerage firms, stating that the directors of the Bethlehem Steel Corporation are opposed to reducing the par value of Bethlehem stock from $100 to $10 a share, as proposed recently. The circular petition prepared by the bankers and brokers had requested this reduction of par value on the ground that at the present high price of Bethlehem stock, there was great danger of wide fluctuations, which the stockholders did not care to see, and further that this step would have a beneficial effect on the market for these shares.

"While we have great respect for the judgment of those from whom these communications emanate," said the letter, speaking for the directors, "we have been compelled to consider the request which they contain from the point of view of the interests of the Bethlehem Steel Corporation and the entire body of stockholders. Viewing the situation from this standpoint, it is our unanimous conviction that it would be a mistake to reduce the par value of the shares from $100 to $10 at the present time.

"Our business at present is large and profitable, but conditions are unusual and any readjustment of capitalization that may be deemed necessary can well await the return of more normal conditions. Furthermore, we are in a position to assure you that the holders of a substantial majority of the stock of our company are opposed to the change."

Increased Earnings

Hon. Nathaniel Currie, president of the Canadian Car & Foundry, Ltd., Montreal, has issued an official statement to the effect that the business of the fiscal year ending Sept. 30 amounts to $150,000,000, as compared with $27,000,000 in the best previous year of the company's history. The plants are working day and night and production is steadily increasing. A large portion of the work is on war orders for the British and Russian governments. An early resumption of dividend payments is expected.

Hendee Report

Hendee Mfg. Co., Springfield, Mass., had its annual meeting there Oct. 27, when the financial report showed profits for the year ending Aug. 31 of $603,829.93, including $2,300 profit from interest on retired first preferred stock. The balance sheet showed assets of $13,689,188.47 and liabilities of $12,831,908.84, leaving a balance of undivided profits amounting to $857,279.63. Samuel H. Miller, New York, and Charles E. Childs, Easthampton, Mass., were added to the directorate to fill vacancies. The seven other directors were re-elected, as were the old officers.

Creditors of the Elwood Iron Works, Elwood, Ind., with liabilities of about $100,000 and assets of about one-fourth that amount, expect to hold a meeting in the near future in an effort to evolve a plan by which the idle plant may be placed in operation. The company is in bankruptcy.

News of Employers and Employes

Pacific Federation Has Timely Discussions of Important Subjects—
Many Organizations on the Coast Represented

(*Special Correspondence.*)

ON Oct. 26 and 27 was held at San Francisco the first annual meeting of the Pacific Federation of Employers. Delegates and members attended from all along the coast and some interesting papers were discussed. As this organization is a new departure in many respects, and as its purposes and the spirit prompting it are significant, it is well to state what the federation is and what it is doing. The casual citizen who happens to know of the association is likely to tell you that it was formed to fight the labor unions, which is not true; because an organization with such an avowed purpose would be unlikely to achieve anything and probably would only stir up trouble. The federation aims to promote the interests of employers by educating the public to see the employers' side of questions, and incidentally hopes to benefit the laboring man by assisting the business which gives him employment. It is realized that a vast influence is waged on legislation, public opinion and the press of the United States by the labor element, which is organized to a considerable extent and equipped to make its influence count. Employers and capital in general have been disinclined to organize on such a tremendous scale as labor, at least in a definite, formal way, so that public opinion has been let drift or influenced mostly from the point of view of labor. The federation is intended to serve as a clearing house on the Pacific coast for advancing these objects, to act as a head or central office for all local manufacturers, merchants and industrial employers' associations. W. C. Francis is secretary of the Pacific Federation of Employers with offices in the Call building, San Francisco.

Many Represented

The meeting was held in the assembly rooms of the Call building on New Montgomery street, adjoining the office of the federation. Delegates from all of the larger cities of the coast were present, representing local associations, together with individual business men who are large employers of labor. Among the cities represented were Spokane, Oakland, Portland, Sacramento, Seattle, San Diego, Los Angeles, Stockton and San Francisco; also Ross Llewellyn, president of the Llewellyn Iron Works, Los Angeles; Chas. Smith, secretary of the California Metal Trades Association, etc. J. Bruce Gibson, of Everett, Wash., president of the federation, presided.

Earl Constantine, secretary and manager for the Employers' Association of Washington, presented a paper on "Legislation". He touched on the ill-considered and hasty legislation that is apt to be jammed through legislative bodies nowadays and which so hampers business that the first man out of a job is the employer. Personal initiative is getting so curtailed by governmental control and bureaucratic meddling that new businesses are not started, and as a result labor finds itself out of employment. Allow business men to exercise initiative and encourage the starting and success of new ventures, and as a natural corollary the employer is benefited.

Seneca Beach, president of the Merchants' and Manufacturers' Association of San Francisco, indicated the "Political Activity of Organized Labor" of recent years. He described the foolish fads and fancies which short-sighted legislatures and councils adopt to the great detriment of business, particularly to the inconvenience and hampering of employers. Socialistic and anarchistic theories of government are trumped up and inflicted on people who haven't taken time or pains to consider the matters properly.

H. E. Wheeler, secretary of the Manufacturers' Association of San Diego, spoke on "Molding Public Opinion" to combat the one-sided, prejudiced and socialistic publicity of cheap journals and labor papers that cater to the popular hues and cries. It is such pernicious and destructive influence that has been to blame for the business doldroms of late years. He would even advocate the general practice of buying space in newspapers and advertising on billboards to state in terse, short and striking words the arguments that present the employers' side of public questions. George S. McCallum, of the Building Trades Employers' Association of San Francisco, presented a forceful and pithy paper on "Strikes", showing the wastefulness and uselessness of strikes resulting in losses to both sides.

J. C. Reynolds, manager for the Employers' Association of the Inland Empire, Spokane, Wash., delivered a particularly interesting talk on a subject typical of the campaign being carried on by the federation. Mr. Reynolds discussed "Labor Publications". He said in part: "I have taken representative issues of six labor papers published in five principal offices of the coast, San Francisco, Seattle, Portland, Tacoma and Spokane. Segregating the display advertisements I find that members of our associations are paying for 163.5 inches or 10.5 per cent; that our near members (people who should be and probably in the near future will be members of our associations) use 202.5 inches or 13 per cent, making a total patronage from these two sources of 366 inches or 23.5 per cent of paid advertisements in these publications.

"I also find that these six journals carry 63 inches of legal advertising, of which 26.5 inches are sheriffs' or county publications, while the remaining 36.5 inches have been inserted by attorneys. Lessons to be drawn from this might indicate that directly and indirectly members of employers' associations are bridging the gap between profit and loss of these organs. In Spokane, the *Labor World* recently declared a 15 per cent dividend for last year's operations; members of the Spokane Employers' Association paid for 15 per cent of their display advertisements. I think it goes without saying that if this support were withdrawn, the paper would either have to seek further support from its adherents or go to another field.

Boycott Measures

Upon this matter being taken up in a prominent way with members of our organization in Spokane, I am gratified to report that some have withdrawn their advertisements and others have promised to do so at the completion of their contracts. Though in exceptional cases, I admit it is difficult to discriminate between worthy and undeserving support, I am firmly of the opinion that the Federation of Employers should hammer away at this question, even to the nature of a boycott, with the ultimate idea of

compelling every such publication to go to its own members for support." Mr. Reynolds' paper elicited lively discussion and such a pertinent and definite matter was thought to be deserving of immediate efforts for carrying the idea into action.

Among other measures and causes opposed at various times by the Pacific organizations in their advancements for simple individual freedom are: Pampering and idolizing the unemployed or that portion of them who are insincere wastrels and Socialists unwilling to work continuously at anything; taxes on private fortunes as a "remedy" for bettering economic conditions; profit-sharing as a sop to labor; government control as destroying initiative in our young men in business (a serious matter); higher wages and so-called better working conditions carried to ridiculous and absurd extremes, as in some labor-union excesses; the throttling of business and industrial declines through unneeded laws and regulations passed without reading by legislatures, etc., who consider that *quantity* of measures passed is the gage of work well done. The federation seeks to show the beneficial and developing results upon communities of encouraging industries, and the need for fair play to the employer to achieve prosperity to the workman.

Labor Troubles

The biggest strike in one plant in the history of Worcester, Mass., occurred Oct. 28, when 1,054 employes of the Crompton & Knowles loom works, the largest loom works in the world, walked out on the refusal of the $3,000,000 corporation to give them a 48-hour work week, an increase of 5 cents an hour in pay, time and a half for overtime and double time on Sundays and holidays. There is practically no prospect of a settlement and every indication of the trouble spreading to other factories which eventually will take in every shop employing machinists in Worcester.

Labor troubles also broke out in Hartford, Conn., the same day when 185 employes of the Hart & Hegeman Co., and 80 employes of the Taylor & Fenn Co., makers of machinery, struck for an eight-hour day and other changes in working conditions. These demands had been refused.

Between 300 and 400 employes of the Springfield Metal Body Co., Brightwood, Mass., went on strike Oct. 26 to enforce their demands for an eight-hour day, time and half for overtime, double time for Sundays and holidays and recognition of the union. The shop has been operated on a 54-hour week basis. Hinsdale Smith, president of the company, says the strike probably will mean the removal of the business to Detroit.

More Houses

The Remington Arms & Ammunition Co., Bridgeport, Conn., which has just completed the construction of 24 houses in East avenue for its employes, has decided to erect 52 more, making 76 in all, thus carrying out the policy it announced several months ago. This action has done much to restore confidence among the real estate men of that growing city, some of whom have hesitated to build homes for what they considered a "boom" population which might leave the city as soon as the demand for war munitions ceased. Frank E. Blake, who is manager of the company's housing plans, states that it has been established there for 50 years and that there is no reason to believe it will not stay and increase with the growth of the city.

Unique Decision

Death from typhoid fever contracted from the drinking water supply furnished by the employer is an accident within the meaning of the Wisconsin workmen's compensation act, according to a unique decision handed down by the supreme court of Wisconsin. The decision will act as a precedent for numerous cases now before the industrial commission.

Gerhard Venner, an employe of the New Dells Lumber Co., Eau Claire, Wis., died from typhoid fever as the result of drinking impure water while engaged in his occupation. The widow brought suit against the employer for $10,000 damages because of the death and for an additional $10,000 for the benefit of the heirs. The company contended that the death was caused by an accident within the meaning of the act, thus placing the maximum liability of the employer at $3,000. The plaintiff contended that the compensation act does not apply and that she is entitled to unlimited damages. The circuit court decided in favor of the employer and is upheld by the higher court.

Safety Sections

At the fourth annual meeting of the National Council of Industrial Safety, held at Philadelphia, recently, the council was divided into sections for the purpose of better conserving the interest of the various industrial and manufacturing activities.

The iron and steel section was organized for work during the coming year, by the election of the following officers:

Chairman, J. M. Woltz, safety director, The Youngstown Sheet & Tube Co., Youngstown, O.; vice chairman, George T. Fonda, safety director, Bethlehem Steel Co., South Bethlehem, Pa.; secretary, Earl B. Morgan, safety engineer, The Commonwealth Steel Co., Granite City, Ill.

There will be no additional cost for membership in this section to members of the National Safety Council.

It is requested that those interested communicate with the secretary of this section at as early a date as possible, so that they may receive all of the communications and papers that are to be issued.

Bucyrus Co.'s Orders

Milwaukee, Wis., Nov. 2.—The Bucyrus Co., South Milwaukee, has issued a statement that in addition to the orders for excavating machinery, the company has taken an order for 8-inch shells, which will not be machined at South Milwaukee. It has also taken an order for forging, which will utilize its furnace capacity not now used for its regular work and will require the erection of a new building for the installation of the necessary presses and furnaces. The company has also received certain miscellaneous machinery orders, such as revetment machines for work on the Mississippi river, and hydraulic presses. It is added: "The recent published statements regarding a merger of the company with other interests are entirely without foundation".

Munitions for the French

The New Haven Equipment Co., New Haven, Conn., is to handle a munitions contract from the French government said to aggregate $60,000,000, the terms of which call for deliveries running well into 1917. It calls for 1,000,000 rifles of a type similar to that of the so-called Spanish Mauser of 1903 at the price of $25 per rifle and for the manufacture of 1,000,000,000 rifle cartridges to be used with the new rifles at the price of about $35 per 1,000. According to the arrangements, the French government is to make advance payments in cash up to the amount of $3,000,000, out of a fund of $15,000,000 now on deposit with certain New York banks.

The West Tire Setter Co., Rochester, N. Y., has recently moved into larger quarters, owing to its increase in business.

State Law Bans Picketing

Evergreen State Legislature Restrains the Unjust Activities of Unions—Measure Awaits Referendum Vote

Earl Constantine, manager of the Employers' Association of Washington, with headquarters in the Central building, Seattle, being questioned by a representative of *The Iron Trade Review* in regard to the anti-picketing law passed by the last Washington legislature, said recently:

"The merchants and business men of the cities of this state, like those of all other parts of the country, have been imposed upon time and time again by the practice of the labor unions of picketing an establishment which for reasons of its own refuses to yield to the unjust demands of the unions.

"The last two years have seen a particularly large volume of picketing in the several cities. It is true that the various employers' associations of the state prosecuted in most cases and have been able to secure for their members injunction orders from the courts. This, however, has been an expense and inconvenience.

"During the last session of the legislature, held in the spring of this year, there was introduced in the senate a bill defining picketing as a misdemeanor. Contrary to the opinion of many as to what would be the chances of this measure, both bodies passed the same with a substantial vote, and with only a few minor changes. The senate passed it by about 24 to 6 and the house by 75 to 16.

"The measure as introduced was a serious attempt on the part of the business interests of this state to secure relief from an illegal practice on the part of the unions. The courts, as you can understand, have always attempted to dodge decisions on this matter, and we felt it necessary that there be specific prohibition which would compel the courts to act and without delay. In our judgment, this law, if allowed to go into effect, will make picketing impracticable to the unions.

"The law would have gone into operation on June 10, except for the fact that the labor unions and their friends successfully circulated a petition referring it to the vote of the people in the general election in the fall of 1916. In the mean time, the matter rests in abeyance."

The following statement has been prepared by the Employers' Association of Washington, which will be published in the official state pamphlet to be distributed to the voters next year by the secretary of state:

The Employers' Associations of Washington have filed with the secretary of state an argument against referendum No. 6 to be included in the pamphlet to be distributed among the voters of Washington. Referendum No. 6 represents the opposition of certain organizations against the passage of what is known as the "anti-picketing" measure and the arguments against the defeat of the measure are forcibly summarized in the article referred to, part of which follows:

Picketing is an unlawful, vicious and destructive practice. It is an instrument employed only by organized labor. It derives its name from the "pickets" who are placed by the unions near a factory or business house to prevent non-union workers from obtaining employment and to stop the patronage or relations of the public with the concern they are attempting to damage. The openly expressed purpose of picketing is to force, by coercion and violence, the employer to accede to the demands the union made before it went on strike.

With few exceptions, picketing culminates in physical attacks both on the plant which is being watched and on non-union workers who may choose to work therein. Picketing wins a victory only by the threat or use of force. It is essentially criminal. It seeks to prevent the employer from carrying on his lawful business and thus interferes with his rights as a free American citizen. It seeks, and frequently succeeds, in keeping the non-union worker from obtaining employment. The latter is usually assaulted and rioting ensues; industrial and commercial plants are often wrecked.

The state sorely needs an anti-picketing law to incorporate into enforceable form the decisions of the courts with respect to this practice. Our own judges have repeatedly held that there is no such thing as peaceful picketing, as claimed by organized labor, and that threats and coercion are of themselves violent acts; that they create in the minds of those attacked a feeling of fear and apprehension, and that it is an unjustified and unlawful interference with the legitimate conduct of business.

The anti-picketing law which you are asked to support by voting against Referendum No. 6, specifies exactly what are now known as principal aspects of picketing and provides a penalty therefor. Even more important than its prohibition of picketing is the provision that any person who instigates and encourages picketing shall also be guilty of such act. It has been a favorite practice of labor leaders to order their members to conduct a picketing campaign and then escape all blame for the lawlessness which results.

Your vote to abolish the practice of picketing, which is similarly being legislated out in other states, will help to remove a serious handicap from our industrial and commercial life. It will guarantee all workers the peaceful pursuit of their labor and establish their right to seek employment where and as they choose.

Stand for law and order.

Vote in favor of this law.

Washington's New Anti-Picketing Law

AN ACT defining picketing, probibiting the same, and providing a penalty for the violation thereof.

Be it enacted by the Legislature of the State of Washington:

Section I. Whoever shall, for the purpose of carrying on, calling attention to, or advertising, directly or indirectly, any controversy, disagreement or dispute between any labor union or organization, or member or members thereof, and any person engaged in any lawful business, or his employe, or for the purpose of hindering or preventing such person from conducting his business in any lawful way, or employing or retaining in his employ any person who may lawfully engage in such business.

(1) Stand or continuously move back and forth, in front of, on the sidewalk, street, public place or private property, or within five hundred feet of any place in which any lawful business is conducted by such other person, or home, or place of abode of such other person or his employe, or

(2) Openly maintain, carry or transport on any sidewalk, street, public place or private property, any banner, sign, transparency, writing or printing, or

(3) Cause any person to do any of the foregoing acts for any of the foregoing purposes,

Shall be guilty of picketing.

Section II. Any person who shall engage in picketing shall be guilty of a misdemeanor.

Section III. The singular number when used in this act shall include the plural and the word "person" shall include individuals, firms, partnerships, associations and corporations.

Section IV. An adjudication of invalidity of any part of this act shall not affect the validity of the act as a whole or any part thereof.

Tool Makers Say "Home Needs First"

Domestic Requirements Increase as Foreign Demand Slackens—Railroads Buy Extensively—Ship Builders Busy—Crane Market Active

ACTIVITY in the machine tool market continues to shift more and more to domestic buying. Good orders are coming from practically all lines of domestic industry and while there are comparatively few transactions of a spectacular character, the total bulk of the business is large. Leading machine tool dealers and manufacturers, who were in New York last week in connection with the conventions of the machine tool builders and machine tool dealers, say that while the improvement is most marked in the east and middle west, it extends practically throughout the country. The principal obstacle in taking care of this demand is the difficulty in making early deliveries which now applies to almost all varieties of machine tools.

The railroads now are the largest buyers, and dealers say the demand from these interests is larger and more general than for a year or more past. The Seaboard Air Line probably was the largest purchaser last week, placing orders for a number of punching and shearing machines and a number of machine tools, in addition to cranes. The Chesapeake & Ohio bought several machine tools and a double-end punch and shear, in addition to a crane. The Baltimore & Ohio and the Philadelphia & Reading placed orders for a number of tools. Several good sized orders were placed by the Chicago, Milwaukee & St. Paul. Several of the railroads have put out small inquiries, among them being that of the Delaware & Hudson, which has asked prices on six or eight tools. The railroad buying is due to the shortage of cars and the necessity of keeping rolling stock in repair.

Good buying continues to come from the ship building interests. The Baltimore Dry Dock & Ship Building Co., Baltimore, placed large orders involving three double-end punches and shears, three single-end punches and shears, a set of bending rolls, a plate planer and a number of machine tools. It is expected Samuel Moore & Sons Corporation shortly will buy a large amount of equipment for its new ship building plant at Elizabethport, N. J. Additional purchases by the Fore River Ship Building Corporation, Quincy, Mass., are reported. The Continuous Casting Corporation, Newark, N. J., is in the market for a lathe for its plant at Garwood, N. J. An interesting transaction last week was the purchase, by the board of education of Jersey City, N. J., of sixteen 14-inch engine lathes to be installed in public school No. 25. The delivery accepted on these lathes is August, 1916. Original bids on these lathes were taken last September.

Buying of machine tools for making war munitions is in less volume. The American Locomotive Co., New York, is asking for quotations on miscellaneous requirements, the Crocker-Wheeler Co., Ampere, N. J., has asked for 10 lathes, and various other munition manufacturers continue to figure in the market, but there is a lack of important business of this character. The export demand as well, continues to decline in volume. Inquiries from Russia, England, Italy and Spain, for instance, are not as abundant as a month ago. This condition is due largely to the difficulty of securing early deliveries. The American Brake Shoe & Foundry Co. is reported to have secured a contract for shells.

The crane market shows more activity. The McClintic-Marshall Co. is about to close on more than 20 cranes for extensions to its plant at Pottstown, Pa. The Fore River Ship Building Corporation is in the market for two ship building cranes having span of 120 feet and capacity either of 10 or 20 tons each. The Waterbury Farrel Foundry & Machine Co., Waterbury, Ct., has bought one 10-ton and one 20-ton Shaw crane. The Bristol Brass Co., Bristol, Ct., bought two 5-ton Northern cranes. The Seaboard Air Line bought five Whiting cranes, one having capacity of 160 tons and the other 10 tons. The Chesapeake & Ohio bought a 10-ton crane and the United States Cast Iron Pipe & Foundry Co. one 10-ton. The Fuller Engineering Co. bought a 10-ton Whiting crane for its plant at Fullerton, Pa. There are several foreign crane inquiries in the market, including one for three 60-ton cranes.

Among eastern concerns who are extending their capacity are the H. B. Smith Co., Westfield, Mass.; the Modern Machine & Tool Co., Albany, N. Y.; Poole Engineering Co., Woodberry, Md.; McClintic-Marshall Co., Pottstown, Pa.; Hyatt Roller Bearing Co., Harrison, N. J.; Merchant & Evans Co., Philadelphia; T. E. Hergert, 422 East Fifty-third street, New York; Hopkins & Allen Arms Co., Norwich, Ct.; Sterling Blower Co., Hartford, Ct.; Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.; W. & B. Douglas Co., Middletown, Ct.; Old Dominion Iron & Steel Works, Richmond, Va.; Louis Sacks Iron Foundry, Newark, N. J.; Heim Machine Co., Danbury, Ct.; Canister Mfg. Co., Phillipsburg, N. J.; Chevrolet Motor Co., New York, and others.

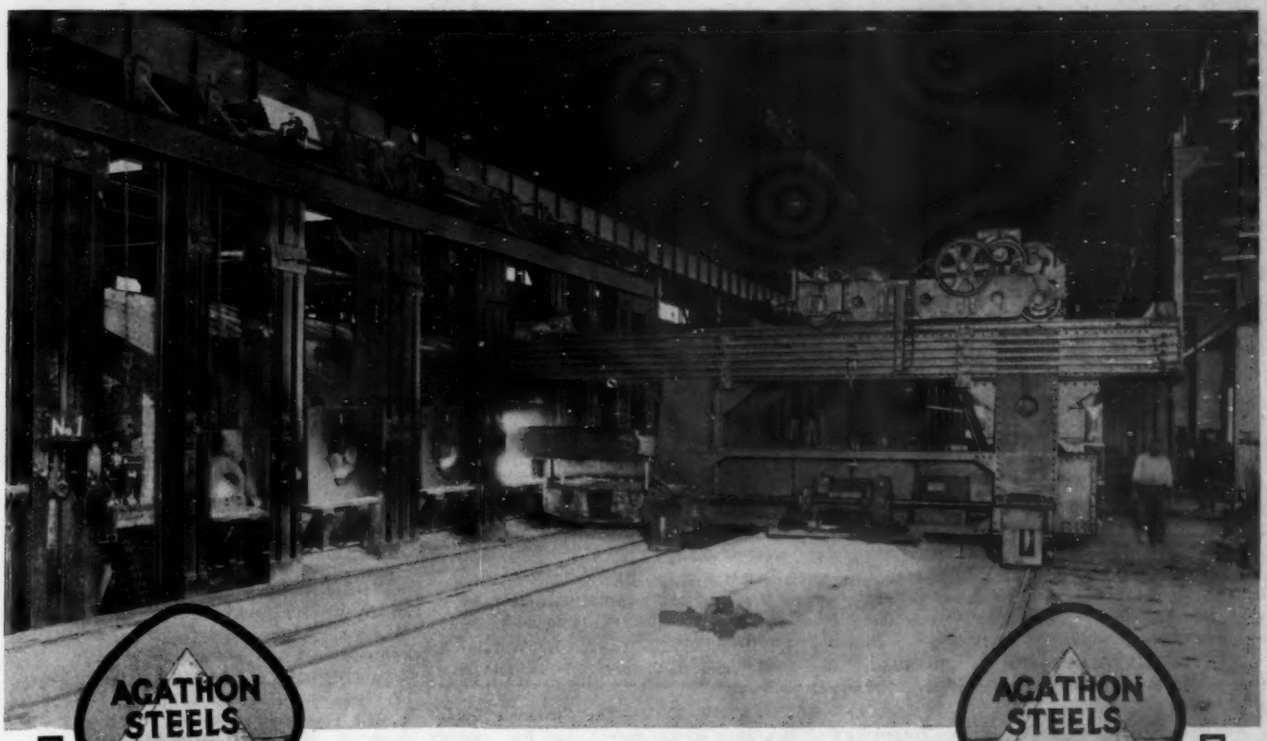
Railroad Inquiries Show Life

INCREASING activity of railroads is the most marked feature of the Chicago machine tool market. The Illinois Central recently closed for approximately $150,000 worth of machines, several of which cannot be delivered until after the first of next year. A further list has been put out by this road for a number of small machines. The North-Western and Burlington have not yet filled their recent inquiries, which were not large.

A Russian buyer who was in Chicago recently managed to obtain about 30 screw machines and about 35 lathes, practically all second hand, which are being shipped to New York for export to Petrograd. Most of the business now being done is in second hand material as most dealers have contracted for the sale of all the machines which will be delivered to them from manufacturers during the present year.

Pittsburgh Market Slackens

THE machine tool market at Pittsburgh is not so active. This is due largely to the fact that most dealers are unable to guarantee deliveries. Builders of cranes are from 18 to 20 weeks deferred in shipments, and grinders and lathes cannot be promised until after Feb. 1. The Republic Iron & Steel Co., Youngs-



Charging Machine at work at Furnace

MAKING

AGATHON STEELS

is a very particular business—and it requires exceedingly particular equipment.

Part of our equipment is the strictly modern, high efficiency, 50 ton Open Hearth Furnace shown above.

Great skill is required in properly charging and melting down the expensive alloys that give Agathon Steels their distinctive qualities, therefore this furnace is in charge of experts of long experience who understand thoroughly *what* they are doing and *why* they are doing it.

All furnace doors, reversing valves, etc., are electrically operated, insuring absolute control.

For handling bulky materials modern electrically operated charging machines are provided.

OUR PRODUCTS

"AGATHON" Chrome Nickel
"AGATHON" Chrome Vanadium
"AGATHON" Nickel Steels
"AGATHON" Special Analyses
"AGATHON" Vanadium
"AGATHON" Silico-Manganese
"AGATHON" Chrome Steel
"AGATHON" High Carbon

THE CENTRAL STEEL COMPANY

MASSILLON, OHIO

Detroit Office: 326-27-28 Ford Bldg., F. Walker Guibert, District Representative
Cleveland Office: Hickox Bldg. ∴ The Hamill-Hickox Co., District Representative

town, O., has closed for five 10-ton and 5-ton cranes, each having a span of 99 feet. A Cleveland company has sold a 5-ton crane to the Lackawanna Steel Co. The Pittsburgh Des Moines Steel Co., which is increasing its capacity, has purchased one 24-inch and one 48-inch open gap punch of the plain jaw type, equipped with special multiple attachments for punching plates, from the Cleveland Punch & Shear Co., Cleveland. Inquiries for punches, shears, drills and reamers are numerous. Dealers in second hand machinery are scouring the market for tools of all types. Builders of heavy rolling mill machinery are operating plants maximum capacity and indications are that they will be busy for the next six months.

Machinists' Strike Halts Deliveries

THE most recent machine tool plants in the Cincinnati district to be affected by the strike of union machinists are the R. K. LeBlond Machine Tool Co. and the J. A. Fay & Egan Co. The strike has spread to 30 plants in Cincinnati and to three shops and four foundries in Hamilton, O. In no case, however, has it been found necessary to close down the plants entirely. Deliveries are being delayed by this agitation, and as a number of concerns are booked to capacity until March, important shipments are being held up, thereby handicapping the market to a certain degree.

Domestic as well as foreign inquiry for heavy lathes is good. There is a marked preference for orders from home industries and contracts are more rapidly accepted, it has been noted, if delivery in the United States is specified.

Inquiries for shapers, milling machines and radial drills are increasing. Among concerns who are making extensions are the Cincinnati Bickford Tool Co., the Cincinnati Milling Co., the Modern Foundry Co. and the Cincinnati Ball Crank Co.

EASTERN STATES

QUINCY, MASS.—The Fore River Shipbuilding Corporation is in the market for two shipbuilding cranes to have span of 120 feet and capacity either of 10 or 20 tons.

WESTFIELD, MASS.—The H. B. Smith Co. will build a 1-story, 30 x 60-foot carpenter shop.

BRIDGEPORT, CT.—The Lake Torpedo Boat Co. has purchased additional property in Bridgeport and it is reported that it is the intention of the company to build a ship yard capable of launching the largest dreadnaughts.

DANBURY, CT.—The Heim Machine Co. has started work on an addition to its plant. The structure will be 16 x 100 feet, two stories. The company manufactures ball bearings.

HARTFORD, CT.—The boiler works of H. B. Beach & Son, 135 Grove street, were damaged by fire.

HARTFORD, CT.—The Sterling Blower Co. has moved to the old plant of the Hartford Foundry Co. and is making improvements.

MIDDLETOWN, CT.—The Carlson Automobile Co. has been incorporated; $50,000 capital stock; by G. E. Carlson, F. S. Bacon and Charles A. Johnson.

MIDDLETOWN, CT. — The W. & B. Douglas Co., pump and machine manufacturer, has secured an order for lathes, on which it will operate night and day shifts. The company plans extensive alterations and two 5-ton traveling cranes will be installed.

NORWICH, CT.—Hopkins & Allen Arms Co. will equip as a woodworking plant the shop on Chestnut street recently purchased from the Norwich Nickel & Brass Co.

WATERBURY, CT.—The Waterbury Farrel Foundry & Machine Co. has awarded a contract for the erection of a 2-story addition, 70 x 160 feet.

ALBANY, N. Y.—Modern Machine & Tool Co. contemplates building a 1-story, 125 x 200-foot addition.

BUFFALO, N. Y.—The Gilford Manufacturing Co. has begun work on a 3-story, 53 x 150-foot factory addition.

LONG ISLAND CITY, N. Y.—The Cobal Co., manufacturer of electrical goods and supplies has leased for a term of years the factory building on Thirteenth street, west of East avenue, Long Island City, owned by the Wilson Remover Co., of Newark, N. J. The Cobal Co. will begin operations as soon as improvements are completed.

NEW YORK.—The Delaware & Hudson railroad has put out an inquiry for six or eight machine tools.

NIAGARA FALLS, N. Y.—The Titanium-Alloys Mfg. Co. has awarded contracts for a brick and steel addition to its foundry.

FORT PLAIN, N. Y.—A. A. Warath & Son, will build a 2-story, 50 x 185-foot factory building.

ROCHESTER, N. Y.—The Guarantee Pump Co. has been incorporated; $100,000 capital stock; by John L. Conrad, Eugene S. Hoopes Beaver, James McKenzie, George W. McKenzie Jr., Rochester and R. B. Nugent, Staunton, Va.

WHITE PLAINS, N. Y.—Wm. W. Ford, So. Lexington avenue, has let a contract for a 3-story, 30 x 90-foot garage and machine shop.

HARRISBURG, PA.—The state water supply commission has applications for the construction of the following bridges: Allegheny county: bridge over Reardon run, near Clinton; Bucks county: bridge over Thousand Acre road, near Almont, and bridge over Snyder creek, near Fairhill; Clarion county: bridge over Hogan run, near Perryville; Erie county: bridge over Sprug brook creek, near Lowels, bridge over Slaughton run, near Elgin and bridge over Walnut creek, near Kearsarge; Kranklin county: bridge over Sprugs creek, near Chambersburg; Juniata county: bridge over Cocolamus creek in Delaware township; Luzerne county: bridge over Laurel run creek, near Wilkesbarre, and bridge over Toby's creek, near Courtdale; York county: bridge over Bennett run in Newberry township.

NEW CASTLE, PA.—The New Castle Rubber Co. plans to increase its capital stock from $500,000 to $1,000,000.

PHILADELPHIA.—Merchant & Evans Co., 517 Arch street, has let a contract for 2-story and basement, 60 x 230-foot factory addition.

PITTSBURGH. — The McCullough-Dalzell Crucible Co., with a capital stock $150,000, has been granted an extension of charter.

PITTSBURGH.—The Atlantic Refining Co. will build an office building, 54 x 154 feet, at Butler and Fifty-seventh street.

PITTSBURGH.—Fire caused considerable damage to a pattern shop of the Jones & Laughlin Steel Co. The loss is estimated at $10,000

PITTSBURGH.—Morris Kaufman will build a 20 x 110-foot loft and store building at 713 Liberty avenue; H. E. Kennedy Co., is the architect.

WEHRUM, PA.—The Lackawanna Coal & Coke Co. is installing a condenser, generator and washer in its power plant.

CENTRAL STATES

CINCINNATI. — The Montgomery pike bridge will be widened at a cost of about $15,000. Approximately 300 tons of reinforcing bars will be needed.

SANDUSKY, O.—The Sandusky Glass Co. has been incorporated to operate the plant of old company which has been idle some time; $10,000 capital stock; by J. C. Hauser and others.

SPRINGFIELD, O.—The Clifton Plating & Mfg. Co. will erect a 2 or 3-story factory addition, 24 x 60 feet. The building will be erected in the rear of the present structure.

STEUBENVILLE, O.—Stockholders of La-Belle Iron Works have authorized a bond issue of $7,500,000 for improvements; $2,000,000 will be spent for a coke plant and $500,000 may be appropriated for a steel bridge to connect the by-product plant, which will be built in West Virginia, with the steel plant at Steubenville; R. C. Kirk is president of LaBelle company.

WARREN, O.—The Trumbull Steel Co. has purchased one 25-ton, one 20-ton, two 10-ton and one 7½-ton electric cranes from the Morgan Engineering Co., Alliance, O. The cranes will be installed in a new addition to the plant.

YOUNGSTOWN, O.—The William Tod Co. has increased its capital stock from $900,000 to $1,500,000. The increase will provide for numerous extensions.

YOUNGSTOWN, O.—The Brier Hill Steel Co. is considering the erection of a battery of by-product coke ovens to supply fuel for its blast furnaces.

BEREA, KY.—The Isaac & Baker Co. is in the market for electrical equipment for a light plant. A franchise has been granted to operate a street lighting system.

ELIZABETHTOWN, KY. — The Cumberland Traction Co., which plans the construction of a 60-mile electric line, has increased its capital stock from $50,000 to $250,000. Address George H. Greenup.

LEXINGTON, KY.—The American Metallic Packing Co. is in the market for a 40-horsepower engine. Second hand equipment will be considered.

LOUISVILLE, KY.—The J. J. Reilly Mfg. Co., manufacturer of pumps, has changed its name to the Freville-Piatt Co.

MATER, KY.—Wiley W. Gibson & Son plan the installation of electric light equipment at Whiteburgh, Ky. Boilers, engines, etc., will be purchased.

SMITHLAND, KY.—The North American

Flourspar & Lead Corporation plan to start mining operations shortly and is in the market for equipment. F. B. Moodie is the president and general manager.

EVANSVILLE, IND.—The Illinois Central railroad has approved plans for the erection of a $70,000 freight depot. It is reported that work will be started immediately.

EVANSVILLE, IND.—Fire seriously damaged the warehouse of L. F. Heilmann. The Louisville & Nashville railroad, it is reported, will lease the land formerly occupied by the building and will lay tracks to enter union depot.

JACKSON, MICH.—The Samuel Austin & Son Co., 14230 Euclid avenue, Cleveland, has been awarded a contract for designing and constructing a plant for the Fox Machine Co., Jackson. Raymond B. Gerard is in charge of the Jackson office of the construction company and has offices in the Dwight block.

MUSKEGON HEIGHTS, MICH. — The Campbell Wyant Cannon Co. will erect a foundry addition estimated to cost $100,000.

SOUTHERN STATES

RICHMOND, VA.—The Old Dominion Iron & Steel works will install an electric steel furnace to have a daily output of 40 tons at its plant at Belle Isle.

CHATTANOOGA, TENN.—The Carter Co. has had plans prepared for the construction of a plant to manufacture commercial sulphuric and other acids.

KNOXVILLE, TENN.—The Ross-Republic Marble Co. is in the market for a 250-horsepower corliss engine to be installed in the mill under construction. Second hand equipment will be considered.

McMINNVILLE, TENN.—The mayor has information regarding the construction of a hydro-electric plant to supply the city of McMinnville with light and power.

WESTERN STATES

FORSYTH, MONT.—H. H. Sebree, who is interested in the Montana Electric Water Co., has had plans prepared for the erection of a factory for the manufacture of an automatic water filter.

GLASGOW, MONT.—Bonds for $18,000 have been voted by the city of Glasgow to purchase equipment and to enlarge the municipal power and light plant.

KALISPELL, MONT.—J. H. Cline has been granted a permit for the erection of a hydro-electric plant on Big creek in this district. The project will furnish power to Polson, Mont.

TERRY, MONT.—L. H. Gaffney has been granted a franchise for the construction and operation of an electric lighting plant.

EMMETT, IDA.—Forest Supervisor Mains has awarded a contract to the James Burke & Co., Kansas City, for a steel bridge over Deadwood creek on the government road at South Fork.

ABERDEEN, WASH.—A committee has been selected by the mayor to take charge of the construction of a $400,000 water works system.

ABERDEEN, WASH.—The Toledo Bridge & Crane Co., has been awarded a contract for the steel to be used in Aberdeen bridge. C. E. Fowler, Central building, Seattle, is the engineer in charge.

BREMERTON, WASH.—A contract has been awarded to the Puget Sound navy yard by the United States government for the construction of a submarine. The Seattle Construction & Dry Dock Co. will build a destroyer.

CAMAS, WASH.—John Rohrberg contemplates the extension of his foundry to provide for molding iron, brass and aluminum.

CHEHALIS, WASH.—Harry Aldis has had plans prepared for a building and will erect a foundry.

SEATTLE, WASH.—The board of public works has authorized the city of Seattle to call for bids on a 250-horsepower impulse turbine.

SEATTLE, WASH.—The utilities committee of the city council plans the issuance of $75,000 in bonds for the erection of a 300,000-gallon capacity standpipe, connected by 16 and 30-inch mains.

SPOKANE, WASH.—The Minneapolis Steel & Machinery Co. has been awarded a contract by the Beers Building Co. for the steel to be used in the Howard street bridge.

SPOKANE, WASH.—The Beers Building Co., Smith building, Seattle, has been awarded a contract for the construction of a steel bridge at Howard street. Morton Macartney is the city engineer.

PORTLAND, ORE.—Crawford & Baltimore, of St. Louis, have been awarded a contract for the construction of a power house for the Portland Woolen Mills.

SALEM, ORE.—The county court plans the erection of a $90,000 steel bridge over the river at Salem.

SALEM, ORE.—H. H. Holmes, assistant highway engineer, has prepared plans for a bridge across the Willamette river at Salem. The estimated cost of the structure is $235,000. Polk and Marion counties will join in the construction of this bridge.

CANADA

NELSON, B. C.—Fred R. Wolfe announces that a 200-ton daily concentrator, hydro-electric power plant and a compressor will be erected at the Florence mines.

WANETA, B. C.—The Waneta Development Co. has started the construction of 80,000-horsepower hydro-electric power plant at junction of the Pend d'Oreille and Columbia rivers.

WINNIPEG, MAN.—The Winnipeg Metal Co., Ltd., has been incorporated; $20,000 capital stock; by Jacob Covensky, Max Baransky, Carl Cook and others.

DUNDAS, ONT.—The Canadian Chadwick Metal Co., Ltd., has been incorporated to carry on business as a founder, engineer and machinist; $40,000 capital stock; by John R. Marshall, Arthur B. Turner and Henry A. Burbidge.

HAMILTON, ONT.—The Canadian Chadwick Metal Co., W. W. Chadwick is interested, is remodeling the Gompf brewery for the manufacture of munitions.

PARIS, ONT.—Paris Wincey Mills Co. has awarded the P. H. Secord & Sons, Branford, a contract for the erection of a $30,000 factory.

RENFREW, ONT.—The O'Brien Munition Co. has been incorporated to manufacture munitions; $2,000,000 capital stock; by M. J. O'Brien and others.

ST. CATHARINES, ONT.—The St. Catharines Steel & Metal Co., Ltd., has been incorporated to engage in the manufacture of ammunition, machinery and tools; $50,000 capital stock; by Harry Short, Alice M. Plunket and Nella L. Nelson.

TORONTO, ONT.—The Specialty Machine Co. has been incorporated to carry on a business of iron founder and mechanical engineer; $150,000 capital stock; by George M. Willoughby, James H. Fraser, Francis H. Hurley and others, all of Toronto.

TORONTO, ONT.—The Neely Rotary Engine Co. has been incorporated to build engines, etc.; $200,000 capital stock; by Wilbur T. Neely, John Whitfield and J. H. Lockington, all of Toronto.

Bright Prospects for Better Business

The H. Clauss Shear Co., Tipton, Ind., is in the market for polishing and buffing machines, sensitive drill presses, ball bearing standards, motor shafting and nickeling apparatus. The company is building an extensive addition to its plant.

The Crocker-Wheeler Co., Ampere, N. J., is in the market for ten lathes.

The Delaware & Hudson River railroad, New York City, is in the market for six or eight machine tools.

The Continuous Castings Corporation, Newark, N. J., builder of machines for casting brass tubing, is in the market for a lathe for installation in its plant at Garwood, N. J.

The Fore River Ship Building Corporation, Quincy, Mass., is in the market for two shipbuilding cranes having a span of 120 feet and of 10-ton or 20-ton capacity.

The W. & B. Douglas Co., Middletown, Ct., machine and pump builder, has been awarded a contract for lathes and has plans for a considerable extension of its plant. Two 5-ton traveling cranes will be installed.

The International Arms & Fuse Co., manufacturer of special ordnance, 200 Fifth avenue, New York City, advises through its secretary, James A. McCann, that it is in the market for ¼-inch and 2¼-inch screw machine products.

The Cincinnati Ball Crank Co., Cincinnati, O., will build a 1-story plant in Oakley. New equipment will be required.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(Delivery to Dec. 31.)

Bessemer, valley	$16.00
Bessemer, Pittsburgh	16.95
Basic, Pittsburgh	16.45
Basic, eastern Pa.	17.50 to 17.75
Malleable, Pittsburgh	15.95
Malleable, first half, Pbgh.	15.95
Malleable foundry, Chicago	16.50
Malleable foundry, Philadelphia	16.75 to 17.25
Malleable foundry, Buffalo	15.50 to 16.00
No. 1X foundry, Philadelphia	16.75 to 17.00
No. 2 foundry, Pittsburgh	15.95
No. 2 fdy., first half, Pbgh.	15.95
No. 2 foundry, first half, valley	15.00
No. 2 foundry, Cleveland	16.30
No. 2 foundry, Ironton	15.50 to 16.00
No. 2 foundry, Chicago	16.50
No. 2X foundry, Philadelphia	16.25 to 16.75
No. 2X fdy., N. J. tidewater	16.25 to 16.75
No. 2X foundry, Buffalo	15.50 to 16.00
No. 2 plain, Philadelphia	15.50 to 15.75
No. 2 plain, N. J. tidewater	15.75 to 16.25
No. 2 plain, Buffalo	15.25 to 15.50
No. 2 southern, Birmingham	13.00 to 13.50
No. 2 southern, Cincinnati	15.90 to 16.40
No. 2 southern, Chicago	16.00 to 16.50
No. 2 southern, Phila. delivery	15.50 to 16.00
No. 2 southern, Cleveland	17.00 to 17.50
No. 2 south'n, New York docks	17.00 to 17.50
No. 2 southern Boston, docks	16.25 to 16.75
No. 2 south. interior, New Eng.	18.00 to 19.00
No. 2 southern, St. Louis	15.90
Virginia No. 2X furnace	14.00 to 14.50
Virginia 2X, Philadelphia	16.75 to 17.25
Virginia 2X, Jersey City	17.10 to 17.60
Virginia 2X, Boston points	17.25 to 17.75
Gray forge, eastern Pa.	15.50 to 15.75
Gray forge, Pittsburgh	15.45
Gray forge, Birmingham	10.50
Silveries, 8 per cent, Jackson, O.	19.00 to 19.50
Silveries, 5 per cent Birmingham	13.25 to 13.50
Silveries, 8 per cent, Chicago	20.00 to 20.50
Standard low phos., Phila.	28.50 to 29.00
Lebanon low phos., furnace	25.00
Low Phos., Pittsburgh	29.00 to 29.50
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	17.25 to 17.75
Charcoal, Buffalo	16.75 to 18.25
Charcoal, Birmingham	21.50

IRON ORE

Lake Superior Ores.
(Lower Coke Reports.)

Old range Bessemer, 55 per cent.	$3.75
Mesabi Bessemer, 55 per cent.	3.45
Old range, non-Bess., 51½ per cent.	3.00
Mesabi non-Bessemer, 51½ per cent.	2.80

Foreign Ores.
(Per unit Philadelphia.)
(Prices nominal.)

Foreign Bess., 50 to 65 per cent.	8 to 8½
For'n non-Bess., 50 to 65 per cent.	8 to 8½

COKE

(At the ovens.)

Connellsville furnace	$2.70 to 2.75
Connellsville fur., Nov. and Dec.	2.25 to 2.50
Connellsville foundry	2.85 to 3.25
Connellsville fdy. contr.	2.85 to 3.25
Wise county furnace	2.50 to 2.75
Wise county foundry	2.75 to 3.25
Pocahontas furnace	2.50 to 2.75
Pocahontas foundry	2.75 to 3.25
New River, foundry	3.00 to 3.50
New River, furnace	2.75 to 3.00

FERRO ALLOYS AND STEEL MAKING METALS

Ferro mang., delivered (prompt)	100 to 105
Ferro mang., Balti., (future)	100.00
Spiegeleisen 20 per cent, furnace	28.00
Ferro-silicon, 50 per cent, Pbgh.	86.00 to 88.00
Ferro-silicon, 50 per cent, Phila.	85.00 to 87.00

Bessemer ferro-silicon, 9 per cent to 10 per cent, $22.00; 10 to 11 per cent, $23.00; 11 to 12 per cent, $24.00; 12 to 13 per cent, $25.00 a ton at the furnace at Ashland, Jackson and New Straitsville, O.

Ferro-chrome, 4 to 6 per cent carbon, 25 cents per pound; 2 per cent carbon, 45 cents per pound, delivered.

Ferro-vanadium, $3.15 per pound of contained alloy, Pittsburgh.

Ferro-carbon titanium, 8 to 12½ cents per pound in carloads.

Nickel, 50 to 55 cents per pound.

Freight Rates via Panama Canal

Rates on finished materials, including plates, shapes, bars, wire, nails, etc., to Pacific coast points via Panama canal, per 100 lbs., in carload lots, exclusive of insurance and dockage.

From New York	$0.40
From Pittsburgh	.619
From Youngstown	.619
From Niles	.619
From Wheeling	.619
From Steubenville	.619
From Johnstown	.604
From Coatesville	.545
From Steelton	.555
From Bethlehem	.529
From Cleveland	.65
From Chicago	.765

Ferro-tungsten, nominal.

Cobalt metal, $1.60 to $1.75 per pound, Pittsburgh.

Aluminum, 55 to 56 cents per pound, New York.

Ferro-molybdenum, Pittsburgh, nominal.

SEMI-FINISHED STEEL

Open hearth billets, Phila.	$32.00 to 34.00
Bessemer billets, Phila.	28.00
Forging billets, Phila.	40.00 to 50.00
Forging billets, Pbgh.	35.00 to 40.00
Forging billets, Chgo.	32.00 to 34.00
Wire rods, Pittsburgh	32.00 to 33.00
Bess. bill., Youngstown	26.00
Open hearth billets, Youngstown	28.00
Bessemer billets, Pittsburgh	27.00
Open hearth billets, Pittsburgh	28.00
Bess. sheet bars, Youngstown	27.00
Op. h'th sheet bars, Youngstown	28.00
Bess. sheet bars, Pittsburgh	27.00
Op. h'th sh. bars, Pbgh.	28.00
Muck bar, Pittsburgh (nominal)	30.00

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh. & Chg.	1.25c
Stand. op-h'th rails, Pbg. & Chg.	1.34c
Light rails 8 to 10 lbs. Pbgh.	1.49c
Light rails 8 lb. Chgo.	1.40c
Light rails 12 to 14 lbs. Pbgh.	1.44c
Light rails 12 lbs. Chgo.	1.35c

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:—

Cleveland	$0.95
Newark, N. J.	2.98
Boston	3.18
Philadelphia	2.78
Pittsburgh	.95
St. Louis	3.18

Buffalo to:—

Albany, N. Y.	$1.26
New England (all rail)	2.58
New York and Brooklyn (all rail)	2.58
New York and Brookyln (by canal)	1.25 to 1.60

Virginia furnaces to:—

Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88

Birmingham, Ala., to:—

Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky	2.65
New York (all rail)	6.15
New York (rail and water)	4.25
Philadelphia (all rail)	5.20
Philadelphia (rail and water)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75

Chicago to:—

Des Moines	$2.80
Milwaukee	.50
Moline, Ill	1.40
Omaha	3.58
St. Louis	1.58

Ironton and Jackson, O., to:—

Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58

Light rails 16 to 20 lbs., Pbgh.	1.39c
Light rails 16 to 20 lbs., Chgo.	1.30c
Light rails 25 to 45 lbs., Pbgh.	1.34c
Light rails 25 to 45 lbs. Chgo.	1.25c
Relaying rails, standard, Pbgh. & Chgo.	$23.00 to 24.00
Relaying rails, light, Chgo.	21.50 to 22.50
Angle bars, st. sect., Pbgh. base.	1.50c to 1.75c
Angle bars, st. sections, Chicago	1.50c to 1.75c
Spikes, railroad, Pbgh.	1.75c
Spikes, railroad, Chgo.	1.80c to 1.90c
Track bolts, Pbgh.	2.10c to 2.25c
Track bolts, Chgo.	2.25c to 2.40c
Tie plates, Chgo.	32.00 to 34.00

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.50c
Structural shapes, Chgo.	1.69c
Structural shapes, Philadelphia	1.659c to 1.759c
Structural shapes, New York	1.669c to 1.719c
Struc. shapes, San Francisco	2.00c to 2.05c
Tank plates, Chgo.	1.69c
Tank plates, Pittsburgh	1.50c
Tank plates, Philadelphia	1.659c to 1.809c
Tank plates, New York	1.669c to 1.869c
Bars, soft steel, Pittsburgh	1.50c
Bars, soft steel, Chgo.	1.69c
Bars, soft steel, Philadelphia	1.659c
Bars, soft steel, New York	1.669c
Hoops, carloads, Pittsburgh	1.75c
Bands, Pittsburgh	1.50c
Shafting, Pbgh., contr. carloads	58 off
Bar iron, Chgo.	1.45c
Bar iron, Philadelphia	1.559c to 1.609c
Bar iron, New York	1.569c to 1.619c
Bar iron, Cleveland	1.40c to 1.50c
Bar iron, Pittsburgh	1.50c
Hard steel bars, Chicago	1.40c to 1.45c
Smooth fin., mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	2.10c to 2.35c
No. 28, black, Chgo.	2.29c
No. 28, tin mill, black, Pbgh.	2.05c to 2.20c
No. 28, galvanized, Pbgh.	3.70c
No. 28, galvanized, Chgo.	3.79c
No. 10, blue anld., Pbgh.	1.70c to 1.80c
No. 10, blue annealed, Phila.	1.809c to 1.909c
Tin plate, 100 lb., coke base.	3.10c to 3.20c

EXTRAS FOR SHEET OR TIN MILL SPECIFICATIONS

(Per hundred pounds.)

Single pickled, cold roll, and re-anl.	30 cents
Hot roll'd pick'd and anl., tin mill.	25 cents
Full pickl'd, cold rolled and re-anl.	50 cents
Auto sheets	75 cents
Blued stove pipe stock	10 cents
Range steel	30 cents
Re-squaring	10 cents
Roller leveling	10 cents
Patent leveling and re-squaring	35 cents
Oiling sheets	10 cents
Deoxiding	10 cents
Lime finish	10 cents
Open-hearth stamping steel, free fr. mill scale	55 cents
Special open hearth deep stpg. steel free from mill scale	80 cents
Extra deep special auto body stock.	$1.25
Ext. for 28 gage ov. 32 to 36-in. wide	10 cents

No reduction for sheets not annealed.

The above extras apply on both sheet and tin mill specification, at the same rate.

IRON AND STEEL PIPE

(Pittsburgh.)

	Black. Butt-weld	Galv. Butt-weld
Steel, ¾ to 3 inches	78	63½
Iron, ¾ to 2½ inches	70	52
	Lap-weld.	
Steel, 2½ to 6 inches	77	62½

BOILER TUBES

Steel, 3½ to 4½ inches l. c. l.	69
Iron, 3½ to 4½ inches l. c. l.	57

WIRE PRODUCTS

(Retailers' price 5 cents above jobbers' quotation.)

Wire nail jobbers, Pittsburgh	$1.85
Plain wire, jobbers, Pittsburgh	1.70
Galvanized wire, jobbers, Pbgh.	2.40
Polished staples, Pbgh.	2.00
Galvanized staples, Pbgh.	2.70
Barb wire, painted, jobbers, Pbgh.	2.00
Barb wire, galv., jobbers, Pbgh.	2.70